The Newspaper of Information Systems Management
June 5, 1995, Vol. 29, No. 23, 148 Pages, $6/Copy, $48/Year

COMPUTERWORLD

SOUR NEWS ABOUT SUITES: CW GUIDE TO APPLICATION SUITES, page 94

'Stealth users' pose threat to NetWare 4

By Laura DiDio

Just when NetWare administrators thought they had mapped out the major minefields in NetWare 4.x, up pops a new threat to enterprise security: the "stealth user."

While more finely tuned than that found in the previous version of NetWare, the security built into Novell, Inc.'s NetWare 4.x and its NetWare Directory Services has more potential loopholes. Administrators can unwittingly expose their businesses to users who can furtively peruse databases, file servers and departments throughout the network as undetected, invisible network moles.

And compromising NetWare 4.x security carries far more serious consequences than similar security lapses in older versions of the network operating system. Security breaches in NetWare 3.x LANs affected only a single file server or departmental LAN. In NetWare

Stealth users, *page 131*

Moving up to ATM

StrataCom's multi-interface switch to cut bandwidth costs

By Laura DiDio

Seeking an early lead in the fledgling ATM enterprise switch market, StrataCom, Inc. this week will unveil a 1.2G-bit switch said to support voice, data and video at speeds of 1.2K to 155M bit/sec. ATM, *Computerworld* has learned.

The new Integrated Gigabit Exchange, which will ship immediately, is StrataCom's first foray into the private Asynchronous Transfer Mode enterprise switch market.

The IGX will also fill the midrange gap in the company's product portfolio and support carrier-type applications for smaller value-added networks, sources close to the company said.

Users could deploy this switch to replace legacy time division multiplexer devices and routers and, in the process, save thousands of dollars in monthly bandwidth charges, analysts said.

Northeast Utilities' John Boyd *says StrataCom's ATM switches could save net managers time and money*

"The StrataCom IGX can potentially save users 5% to 20% in recurring monthly bandwidth charges. And I expect the IGX could pay for itself in 12 to 18 months based on monthly savings in bandwidth alone," said Eric Hindin, senior network consultant at Strategic Networks Consulting, Inc. in Rockland, Mass.

One of a kind

Industry analysts familiar with this type of midrange switch said that while San Jose, Calif.-based StrataCom has competition in the market, the IGX is thus far the only switch that supports 20 interfaces. Those interfaces reportedly range from low narrowband speeds of 1.2K bit/sec. to full high-speed broadband 155M bit/sec. ATM cell-based switching.

ATM cell-based switching transfers multimedia information — voice, video and data — across a single high-speed fiber-optic network. This class of switch from StrataCom and other vendors such as Cascade Communications, Inc., General Datacom Corp. and Northern Telecom, Inc. is a natural successor for users migrating from older networks. These midrange ATM switches will let businesses consolidate all types of traffic onto a single net-

ATM, *page 131*

On-line boundaries unclear

Internet tramples legal jurisdictions

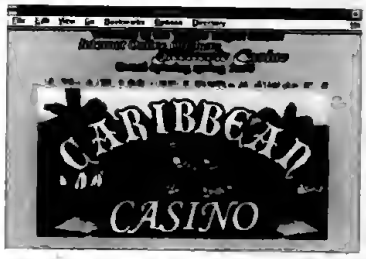
By Mitch Betts and Gary H. Anthes

"Welcome to the World's Largest Casino!" blares the sign in garish colors. But this isn't Las Vegas, it's cyberspace. And the sign is really only a handful of bytes on a server located on the Dutch side of St. Maarten.

The offshore Internet Casino, Inc. goes on-line this month with digital blackjack, poker, slot machines and the like. But there is one small problem: Gamblers who make virtual visits to the Internet Casino could face fines or jail time under federal and state laws that prohibit on-line gambling.

The on-line world's lack of respect for state and national borders is making a mockery of out-

Legal jurisdictions, *page 16*



Visiting Internet Casino *'s home page could mean fines or jail time, depending on where you live*

Prodigy ruling could chill IS plans

By Ellis Booker and Gary H. Anthes

Corporate users building businesses on the Internet had better pay attention to the legal ramifications of the recent decision in a $200 million libel suit against Prodigy Services Co.

A New York state court ruled that Prodigy's editing of content on its on-line service placed it in the class of "publisher," thereby exposing it to a libel claim. If upheld, the ruling could have unwelcome consequences for corporate users building an on-line presence.

Legal experts said the case highlights the risks faced by any company that puts information out before the vast on-line commu-

Prodigy ruling, *page 16*

Skates on thin ice with DG users

By Neal Weinberg

Loyal but increasingly edgy Data General Corp. users have taken the unprecedented step of asking Chief Executive Officer Ron Skates for a face-to-face meeting to discuss the company's product directions.

Last week, Skates agreed to the meeting with representatives of the North American Data General Users Group, although a date has not been set.

Chief among the user worries is that the Motorola, Inc. 88000 microprocessor that powers DG's hardware is running out of steam. Customers are also having trouble finding software to run on DG's Aviion Unix boxes. And despite numerous restructurings, DG has lost money in eight of the past nine years.

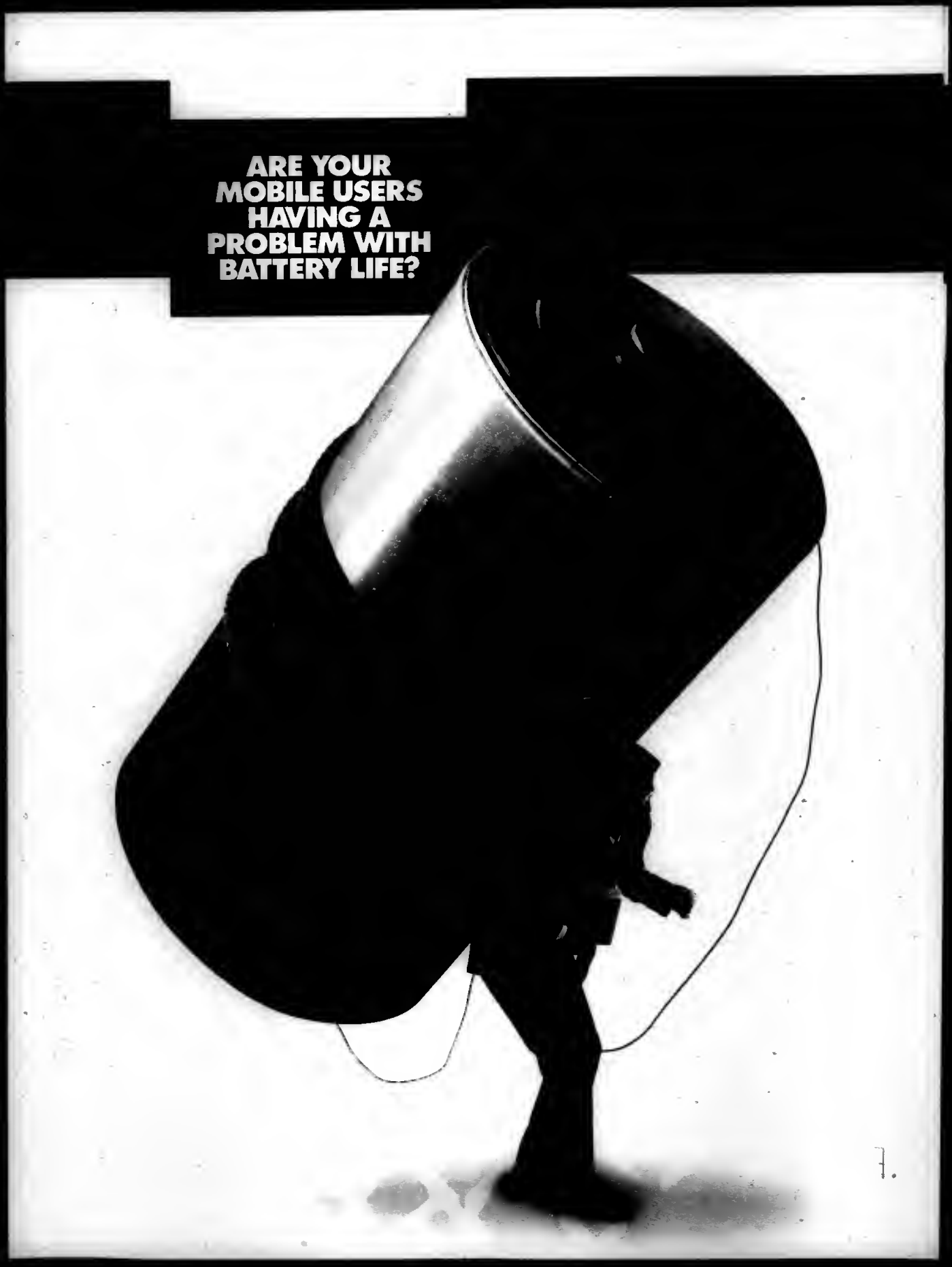
DG, *page 12*

Newspaper
#BXBBJFT#****** CAR-RT SORT ** C035
#UIV72E300M099039# 0010110148
UNIVERSITY MICROFILMS INT 0002
UNIVERSITY MICROFILMS INT 0011 6 XC
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48103-1553

Smarten up!

Can "knowledge management" help companies work smarter, better and faster? If early adopters such as GM, Skandia and others are right, this emerging trend will mean both new opportunities and new headaches for IS.

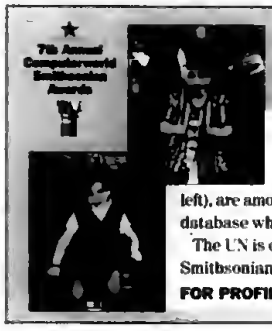
MANAGEMENT, PAGE 84


ARE YOUR
MOBILE USERS
HAVING A
PROBLEM WITH
BATTERY LIFE?

A PUBLICATION OF IDG

What's Inside

June 5, 1995



Making a difference

In the former Yugoslavia, a CD-ROM system is being used to reunite families separated by war. Benjamin Smailbegovic, 2 (top left), and his sister, Murisa, 4 (bottom left), are among the 5,500 children listed on the United Nations-supported database who hope their parents find them.

The UN is one of 50 finalists for the Seventh Annual *Computerworld* Smithsonian Awards, which honor applications that benefit society.

FOR PROFILES OF FINALISTS, SEE IN DEPTH, PAGE 101

■ Two weeks after Computer Associates announced it would buy Legent for $1.8 billion, the realities of **merging product lines** has begun to raise concerns in some parts of the user community. **NEWS**, *page 2*

■ **Systems integration vendors are losing market share** to faster, more flexible boutique firms. **NEWS**, *page 4*

■ A coalition promoting **network interoperability** is struck down by the House of Representatives. **NEWS**, *page 8*

■ An upcoming version of the Open Software Foundation's **Distributed Computing Environment software** has been split into two releases, and most of the promised goodies are being delayed from this fall until mid-1996. **NEWS**, *page 10*

■ **Version 4 of Notes is delayed**, but users are not too worried. **NEWS**, *page 12*

■ The **Federal Communications Commission** issues its Integrated Services Digital Network price-cutting proposal. **NEWS**, *page 15*

■ **Dun & Bradstreet Software**'s code modification lawsuit with Grace Consulting spills over into the customer base and ticks off users. **NEWS**, *page 24*

■ **Microsoft Windows NT-based servers** are still playing catch-up to other kinds of boxes. **DESKTOP COMPUTING**, *page 45*

■ There are ways to **reduce the stress level of help desk personnel**, Nina Kawalek says. **DESKTOP COMPUTING**, *page 46*

■ **Novell promises a client/server version** of its groupware product by the end of next March. **WORKGROUP COMPUTING**, *page 49*

■ Simply equipping a sales force with mobile computers isn't enough. **Sales professionals must be integrated** into the enterprise with full access to key corporate data. **WORKGROUP COMPUTING**, *page 49*

■ A new software package connects **disparate E-mail systems**. **ENTERPRISE NETWORKING**, *page 56*

■ Little computers can do the job of big systems, it seems. A **cluster of Unix workstations** at three universities will turn the network into a computer this summer. IBM unveils its **mainframe-in-a-PC** box. **LARGE SYSTEMS**, *page 65*

■ **AT&T Solutions** has moved into managing applications in addition to outsourcing. **LARGE SYSTEMS**, *page 73*

■ SAP and Dun & Bradstreet Software are on track with their plans to release **distributed versions of their applications**. **LARGE SYSTEMS**, *page 73*

■ Mainframe shops are running headlong into a new client/server world order in which **developing new applications can be easier than deploying them**. **APPLICATION DEVELOPMENT**, *page 79*

■ **Aerospace industry** jobs are drying up, but recent contracts have spawned hundreds of IS openings at select firms. **CAREERS**, *page 107*

■ Integrated **"Works" packages** can't compare to the likes of Microsoft Office on the features front, but fewer storage and memory requirements may appeal to some. **MARKETPLACE**, *page 120*

■ **Software suites** may seem affordable on the surface, but beware of hidden costs and interoperability and complexity problems. **CW GUIDE**, *page 94*

Calendar has a new look!
Our comprehensive list of events is now easier to read. See page 93.

■ Dissatisfied customers can always vote with their feet — or their mugs, **Bill Laberis** points out. **VIEWPOINT**, *page 36*

■ Groupware is largely irrelevant to the way people do their jobs, **Michael Sebrage** says. **VIEWPOINT**, *page 37*

■ Access to information has to improve ASAP, **Marcia Blumenthal** says. **VIEWPOINT**, *page 37*

■ By backing off the Intuit deal, Microsoft recognizes that its greatest opportunity still lies in the commercial market, not the consumer world, **Charles Babcock** says. **COMMENTARY**, *page 132*

Calendar ..... *Page 93*
Company Index ..... *Page 128*
Editorial/Letters to the editor ..... *Pages 36, 39*
June 2 Stock Ticker ..... *Page 129*
How to contact Computerworld ..... *Page 132*

Executive Briefing

In Internet news this week: Netscape adds a shrink-wrapped, retail package to its browser family; a full-duplex Internet phone debuts; and outsourcing flourishes. *Pages 14 and 20.* Products emerge to help honest folks pay royalties for on-line information, and a shareware videoconferencing tool goes commercial. *Page 58*

As the global network makes national boundaries all but meaningless, the U.S. lacks the policies and legal framework for dealing with electronic attacks; "stealth users" make an appearance on Novell networks. *Cover 1 and Page 55.* The number of security products is growing, though. A PC virus protection product causes a controversy; Xyplex adds security features to its hub family; and a new utility scans NetWare networks for unauthorized users. *Pages 41, 57 and 131*

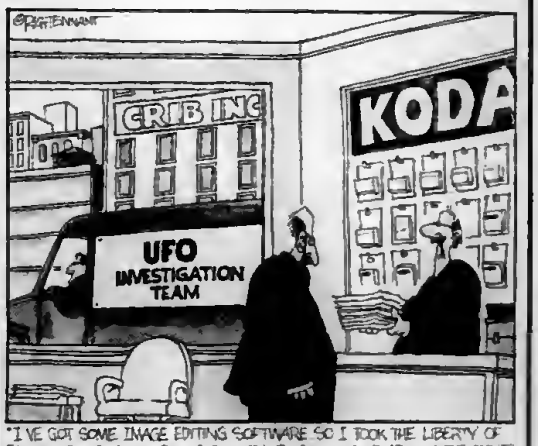
Microsoft previews tools for writing Windows applications and prepares to demonstrate new versions of SQL Server, Visual FoxPro and other packages at PC Expo. *Pages 2 and 6.* There's a big brou-ha-ha brewing between Microsoft and other electronic messaging vendors as **Lotus** and **Novell** accuse Microsoft of not playing fair with its Messaging Application Programming Interface specifications. *Page 29*

Hewlett-Packard enhances its OpenView systems and network management products. *Page 4.* **McAfee Associates** buys a client/server systems management vendor. *Page 32*

A surprise database decision ensues from USF&G, a large insurance firm. *Page 29.* **Red Brick** has a tough time competing with the big database players. *Page 32.* **Oracle** plans a version of its database designed specifically for warehousing. *Page 77.* Meanwhile, more products are available to help bridge the gap between object-oriented applications and relational databases. *Page 77*

Upcoming PowerPC announcements from **Apple** and **IBM** are expected to give the platform a much needed boost. *Page 6.* **IBM** pulls out all stops to lure developers to OS/2. *Page 45*

The 5th Wave *by* Rich Tennant



"I'VE GOT SOME IMAGE EDITING SOFTWARE SO I TOOK THE LIBERTY OF ERASING SOME OF THE SMUDGES THAT KEPT SHOWING UP AROUND THE CLOUDS. NO NEED TO THANK ME."

GET THEM DELL'S
COAST TO COAST
PENTIUM-BASED
NOTEBOOK.
intel inside
pentium

$5399 $3999 $3199

Whether they're on the road, in the air, or in the field, your users shouldn't have to suffer with a Pentium® processor-based notebook that only lasts an hour or two.

Introducing the Dell® Latitude™ XPi. The first Pentium processor-based notebook that can last take-off to touch-down. Coast to coast.

You won't find another notebook that can offer the power of a Pentium processor. And a 10.4" display with high-speed video. And this much battery life.

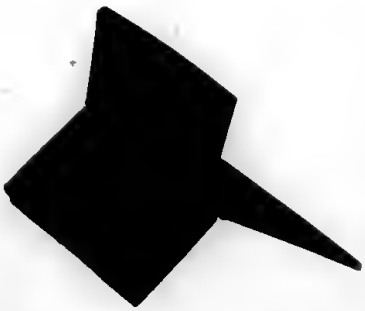
How much battery life?

Well, according to recent "Cross-Country"™ tests by VenTest, inc., the Dell Latitude XPi P75 dual scan notebook lasted an average of 4 hours and 40 minutes*. That's LA to New York, no problem. Of course, actual battery life will vary depending on nature of use and configuration. Your users might get even more.

How do we do it?

For one thing, the Dell Latitude XPi is the first notebook to use Intel's 2.9 volt LM Pentium chip, specifically designed for mobile computing.

But there's more to longer life than a chip.



Dell's smart Lithium Ion battery pack design includes an embedded microprocessor that allows the battery cells to charge faster and hold a charge longer than the cells in other notebooks. (We charge up to 15% higher, in fact.)

And our power management software adjusts power consumption based on how your users work. We even go so far as to power down system components when they're not in use. All without interrupting your users. So whether they have ten applications open at once or keep their notebooks on all day, they'll get better battery life.

Without sacrificing a thing.

Just call our national account team and try the Dell Latitude XPi. The only Pentium processor-based notebook that can last coast to coast.

DELL

(800) 232-8546

Keycode #12043

*The VenTest Cross-Country v2.0 test simulates typical executive use of Microsoft Office® applications in Microsoft Windows® v3.11 during an airplane flight. Power management was enabled and 8MB of RAM was installed. VenTest, inc. is located in Santa Monica, CA. †For a complete copy of our Limited Warranties, please write to Dell USA L.P. 2214 W. Braker Lane, Bldg. 3, Austin, TX 78758. Prices valid in the U.S. only and subject to change without notice. Pentium and the Pentium processor logo are registered trademarks of Intel Corporation.

©1995 Dell Computer Corporation. All rights reserved.

Legent users jittery about vague CA merger plans

By Thomas Hoffman

Two weeks after Computer Associates International, Inc. announced it would buy Legent Corp. for $1.8 billion, the realities of merging product lines began raising concerns in some parts of the user community.

CA executives offered scant details about their Legent product integration plans at a joint press conference last week. The uncertainty that often rides between an acquisition and a firm statement of direction is now fueling Legent customer concerns.

Sanjay Kumar, CA president and chief operating officer, confirmed that the Islandia, N.Y., company plans to tighten the integration between CA-Unicenter, Legent's XPE products and BMC Software, Inc.'s Patrol intelligent agent software.

"Does this mean we're going to have to be dependent upon CA-Unicenter?" asked an uncomfortable Joe Jedynak, a technical support manager at *The Hartford Courant* in Hartford, Conn.

Jedynak, whose shop recently acquired Legent's Cross-Platform Environment (XPE) systems management software, said he is reluctant to see that software integrated into CA-Unicenter. That is because he finds the CA package "very, very expensive" and lacking in areas such as help desk management and capacity planning.

Wait a minute

"The news certainly stopped us in our tracks, especially with the initiatives we had going on with Legent," said David Ward, manager of worldwide network operations at American Greeting Corp. in Cleveland. The greeting card maker had planned to install Legent's AgentWorks intelligent agent software on top of RISC-based machines, but that idea has been put on hold until the firm can assess the support, maintenance and cost issues following CA's ownership of this product, Ward said.

"All of those [issues] are subject to the whims of Computer Associates, but they become absolutely critical to us as a user of these products," he added.

Industry analysts have generally characterized the Legent acquisition as a major boost for CA's future earnings potential and expansion into the client/server market.

But "the view for users is decidedly negative," said Dale Gardner, an analyst at Meta Group, Inc. in Reston, Va. "Although alternatives to CA/Legent do exist, the further elimination of competition will reduce choice and prop up prices, negatively affecting users," Gardner said in a Meta Group report issued last week.

Furthermore, CA plans to "bolt" Legent's Paradigm/XP help desk and problem management software, as well as Legent's Distribu-Link software distribution products, onto CA-Unicenter, said Charles B. Wang, CA's chairman and chief executive officer.

When the CA/Legent acquisition was announced, some Legent customers expressed optimism that they would be able to buy Legent software at fire sale prices. In fact, one information systems manager at a Midwestern apparel distributor who requested anonymity said he was able to purchase IBM DB2 utility software from Goal Systems International, Inc. at a significant discount just prior to that company's acquisition by Legent in 1992. Goal Systems' salespeople "wanted to make a commission while they still could," he said.

However, under its proposed acquisition of Legent, CA has the right to review all customer contracts of unusual size that are made before the deal closes in July, Wang said. "Nobody's going to do any bastard business," he added.

Uncertain future

That is bad news for Legent sales representatives, who along with the bulk of the Herndon, Va.-based company's administrative staff face the unwelcome prospect of cleaning out their desks during the next six months. Although Wang said his firm is giving Legent's 700 salespeople first crack at the 500 field-office openings CA has available, the cultural transition for those who are retained is likely to be thorny at best.

"For people who have been here a long time, it's been embedded in their blood to compete against CA, to hate them and to win," said a Legent salesperson who requested anonymity.

Senior editor Steve Moore contributed to this report.

Enhancing services

CA plans to absorb many of Legent's 500 technical services group employees. That's because it wants to beef up its professional services offerings for customers who seek help implementing large-scale versions of the CA-Ingres relational database and CA-Unicenter systems management technology, said Charles B. Wang, CA's chairman and CEO.

When opportunity knocks...

Like vultures to roadkill, it didn't take long for Computer Associates' competitors to swoop down and take advantage of the confusion in the Legent customer ranks.

Boole & Babbage, Inc. last week rushed out a special program aimed at converting Legent data center automation products, such as Automate, to Boole & Babbage's MainView AutoOperator package within a matter of days — without requiring developers to rewrite a single line of code.

"The program is actually for anybody, but we thought [CA's plans to acquire Legent represented] a good opportunity to promote it," said John Connor, director of automation products at the San Jose, Calif.-based provider of enterprise automation software. Connor said the Legent program follows a similar program that Boole & Babbage has been offering to users of Candle Corp.'s AF/Operator for MVS in the past year.

During the past year, Boole & Babbage has lured 40 Candle, IBM and other customers to its AutoOperator package, according to Tim Dreisbach, senior vice president of sales at the $150 million firm.

Connor estimated Legent's worldwide Automate customer base to be 750 installed sites.

— Thomas Hoffman

Microsoft previews tools for Windows 95

By Elizabeth Heichler
SANTA CLARA, CALIF.

Developers building applications for Microsoft Corp. platforms got a first look last week at tools the company plans to offer when it finally ships the Windows 95 operating system later this year.

At the Microsoft Foundation Classes (MFC) developers' conference held here, Microsoft revealed some highlights of the forthcoming Visual C++ 4.0 development environment to some 2,000 attendees. Those features are intended to ease the pain of writing 32-bit Windows applications. Visual C++ 4.0 will ship within 30 to 90 days of Windows 95 general availability, according to the company.

But corporate developers were in the minority compared with independent software vendors and commercial developers at the sold-out technical conference. Several said that although they are using the MFC class library (see box) to write C++ applications for Windows NT, they aren't ready yet to migrate their shops to Windows 95.

And while Microsoft's development tools are moving into the 32-bit world, continued support for 16-bit development aimed at the Windows 3.1 desktops that dominate corporate America was a concern for this group.

For example, until users at New York financial services company Dreyfus Corp. are ready to move to Windows 95, many of the new features in MFC 4.0, which will be included with Visual C++ 4.0, will not be important to senior programmer analyst Siegfried Titsch.

"It's just a matter of time before users move to Windows 95, but we can't twist their arms," Titsch said, citing the need for hardware upgrades and the constraints of users' departmental budgets as factors slowing the migration to the new operating system. Titsch uses Visual C++ for large, number-crunching problems where Visual Basic does not offer sufficient performance, and he just recently began working with Windows NT.

Windows framework

Microsoft Foundation Classes, or MFC, is a C++ class library — a set of reusable source code — that provides developers with a framework for building Windows applications. Developers can use the MFC code to provide basic Windows functionality and also to write Windows-compatible applications that take advantage of new 32-bit technologies, such as OLE and ODBC.

Help for 32-bit development

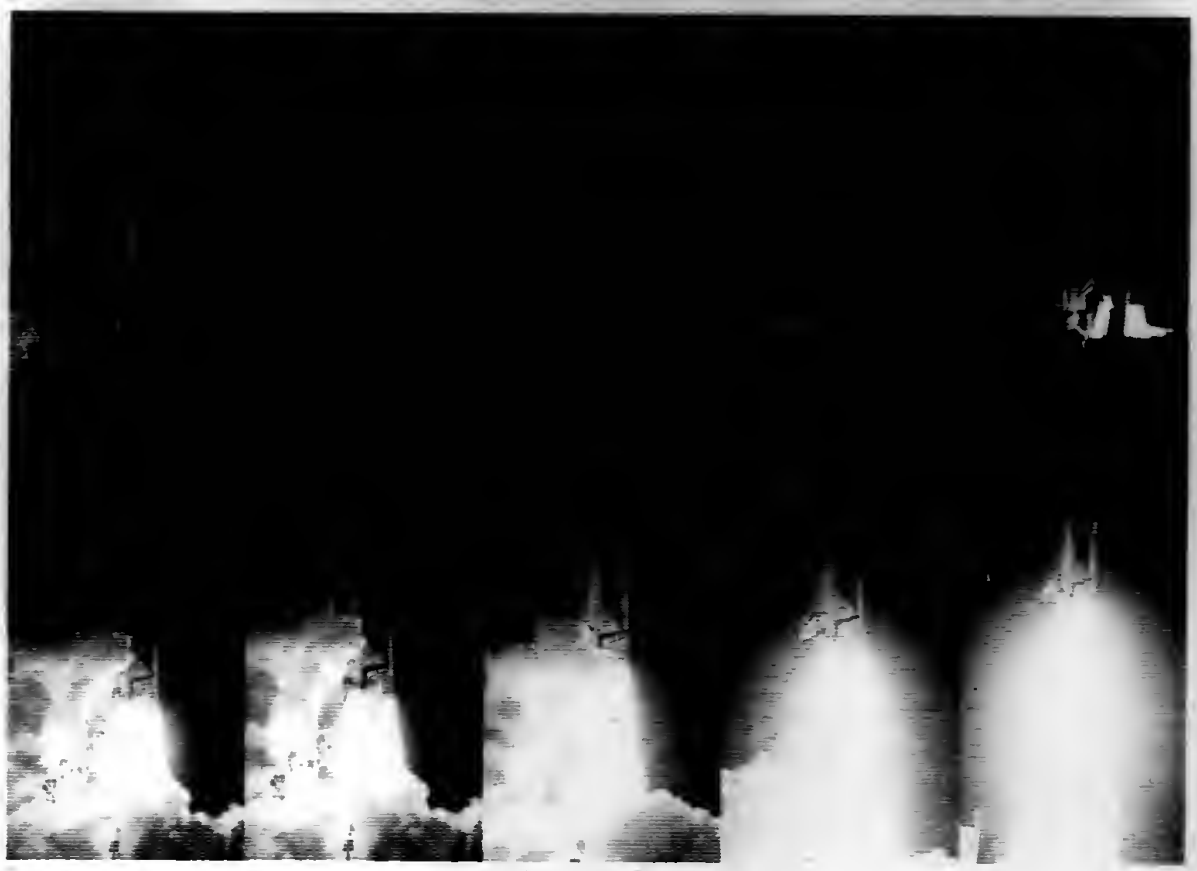
Developers who have made the move to the 32-bit world said the improved support for easier OLE programming found in MFC 4.0 is welcome news.

OLE is Microsoft's object technology that allows applications to be launched from within other applications and provides a standard interface, allowing pre-existing building blocks, called OLE controls, to be incorporated into programs.

MFC 4.0 will include OLE container support, which means developers will be able to use off-the-shelf OLE controls or build them into their applications. Currently, MFC provides tools for building these controls but does not give developers a way to use the resulting components.

The addition of a data access object that provides a direct connection to the Jet database engine found in Microsoft Access and Visual Basic will be helpful to Jose Mascaros, a developer at System One Corp. The Miami-based company builds information management systems for the travel industry. Mascaros anticipates that the data access object, which can be used as an alternative to the Open Database Connectivity (ODBC) interface, will speed application performance.

We Make The World's Best Mission-Critical Software. And We Can Prove It In Just Ten Seconds.



When every second is critical, you need database technology you can count on. Which is why you'll find CA-OpenIngres® on board wherever client/server applications need to be mission-critical.

Of course, it doesn't take a rocket scientist to figure out why. After all, no other company has more experience in mission-critical heterogeneous computing than Computer Associates. Or the confidence to back up that knowledge with technical assistance available 24 hours a day, seven days a week, at no extra charge.*

Put all that behind the exceptionally advanced technology of CA-OpenIngres, and you've got a global, enterprise-wide information management system that's simply unsurpassed. Which explains why it's used by over 9500 companies worldwide.

For more information on CA-OpenIngres, **call 1-800-225-5224, Dept. 12102.** Because with the right database technology, there's no telling how far your business can go.

COMPUTER® ASSOCIATES
Software superior by design

New CA-OpenIngres®

© 1995 Computer Associates International, Inc., Islandia, NY 11788-7000. All products referenced herein are trademarks of their respective companies. *Available only to licensed CA-OpenIngres users who are both on active maintenance and whose accounts are current

HP bolsters OpenView for distributed nets

By Patrick Dryden

■ Striving to meet demands for scalable control of distributed computing environments, Hewlett-Packard Co. introduced major upgrades to OpenView network and systems management products last week.

Version 4.0 of Network Node Manager, the foundation of the OpenView framework, lets more operators monitor more nodes through a sleeker interface and offers a cheaper license for branch sites. Version 2.0 of OperationsCenter, the problem-management service, extends interactive control throughout domains of an enterprise.

HP's OpenView enhancements

Network Node Manager Version 4.0 (core network management platform), which is due in October, will include the following:

■ **Client/server design**
- More operator consoles
- Ability to handle bigger networks

■ **Improved interface**
- Quick view into network map
- Tool bar, hypertext on-line help and event browser
- Vendor-specific menus

■ **Oracle as data repository option**

■ **Small-site package: $5,000 for up to 100 devices**

OperationsCenter Version 2.0 (central problem manager for systems/networks), which is due in August, will include the following:

■ **Manager-to-manager communication**
- Hierarchy for monitoring and escalating problems
- Centers of expertise established
- Responsibility shifted by time zone
- Backup center takes over in emergency

■ **API for managing legacy systems**
- Prevail/XP by Legent
- Command/Post and Ensign by Boole & Babbage

Still, these first two portions of HP's slow-evolving Tornado project will not be available until later this year, along with two upgrades to storage management products. Tornado encompasses HP's efforts to make OpenView a fully distributed, scalable and object-oriented manager of all components of an enterprise network.

Introducing them now lets HP whet the appetites of attendees at the OpenView Forum users' conference June 18-23 in Seattle.

But OpenView users are already hungry for the main course. One of the forum topics, for instance, is "Scalability for OpenView: Surviving Until Tornado."

"We need these upgrades now so we don't have to build our own software to offset limitations in Network Node Manager and OperationsCenter," said Brennan Carley, vice president of information technology at New York-based Instinet Corp., an institutional brokerage firm. "HP is addressing our needs but not as quickly as we would like."

Waiting game

Network Node Manager has not scaled very well as the network for Duke Power Co. in Charlotte, N.C., has grown to require 22,000 objects in the OpenView database, said Paul Edmunds, an information technology professional responsible for management.

"With the performance problems we're experiencing now, surviving until the October release of Version 4.0 will be difficult," Edmunds said. "But HP is going in the right direction with Phase 1 of Tornado."

The new Network Node Manager splits the display console function from the management server to free CPU cycles and from 40% to 60% of memory, said Gordon MacKinney, OpenView program manager for HP's network and systems management division.

The client/server design boosts response rate and the number of nodes monitored by 50%, MacKinney said.

With about 50,000 managed devices in its internal network, US West Communications, Inc. in Denver rates Network Node Manager's performance acceptable, given the promise of extended management via the new OperationsCenter capabilities.

"You'll exceed the capability of the human operator before the capability of any serious management platform," said Rick Sturm, US West technical staff member. "That's why we need to create a hierarchy of management personnel: Then we can refer or escalate a problem to the subject-matter experts wherever they may be."

Goliaths losing ground in systems integrator market

Users say smaller shops offer faster, customized solutions and services

By Julia King

Companies in the market for a systems integrator are going "boutique shopping" — turning to relatively small companies for help developing multimillion-dollar, mission-critical business applications.

This trend could be a threat to the big guns, according to a report issued last week by Para-Technology, Inc., a market research and consulting company in Bellevue, Wash. Last year, the largest integrators, including Andersen Consulting and Electronic Data Systems Corp., lost a 4% share of the booming $50 billion integration services market to smaller, more nimble competitors, the report said.

Users say the boutiques are faster, cheaper and far more skilled in client/server, object-oriented and other advanced technologies.

They are also more adept at devising customized solutions and are willing to partner with clients rather than just pay lip service to the concept during sales pitches, customers added.

Happy camper

Consider the case of Steve Little, vice president of information services at Square D Co., a $2 billion manufacturer of electrical equipment in Palatine, Ill.

Little solicited four providers to bid on a $20 million project involving the company's order-entry and shipping systems. Respondents included $3 billion Andersen Consulting and Technology Solutions Co. (TSC), a $53 million company in Chicago specializing in client/server projects.

"TSC came in and spent two weeks in my office, analyzing my project and basically laying out a project plan," Little said. "They brought in their experts and talked to my database people and my telecommunications people. And we didn't pay for any of that time up front."

Andersen, by contrast, "pretty much gave me a boilerplate proposal," Little said.

John Charles, assistant director of information technology at Harvard University, said he was impressed when Innovative Information Systems, Inc. in Norwood, Mass., sent company president Mark Shirman to present its proposal for migrating several mainframe systems to a client/server environment.

Like Little, Charles also had solicited bids from larger vendors, including IBM's Integrated Systems Solutions Corp., "but they just weren't as flexible, and the pricing was not very close at all," he said.

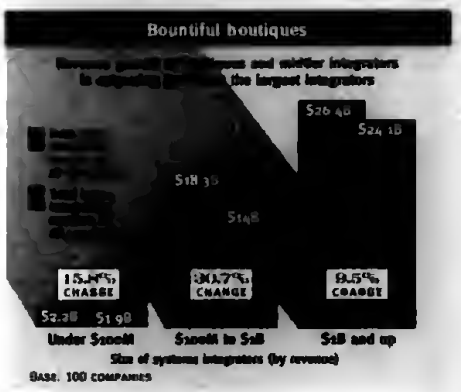
"Also, the feeling we had is that trying to work with some of the larger outfits was a very protracted process," he added. "We wanted people we felt were schooled in the newer, rapid application development technologies."

Fast-growing companies that fall into the boutique category include Analytical Technologies, Inc. in Bingham Farms, Mich., BSG in Houston and Cambridge Technology Partners in Cambridge, Mass.

"Every year, there has been an increase in the number of customers and projects being directed at integrators," said Peter Raulerson, president and chief executive officer of Para-Technology. "This has resulted in 40% to 50% growth for smaller boutique companies but only about 15% to 20% for the very largest companies."

Change of plans

Users' readiness to hire smaller, less well-known companies for high-profile projects marks a major change on the systems integration front.



Source: ParaTechnology, Inc., Bellevue, Wash.

"Five years ago when we were out in the marketplace, we were attractive only to the renegade IS departments," said Bob Gett, president of Cambridge Technology Partners, a client/server integrator known for fixed-base pricing, which is something of an anomaly in the consulting/systems integration world.

Today, by contrast, most clients are more concerned with completing projects on time, "so we don't see very much resistance to us on the basis of our size," Gett added. "Companies see losing time as a far greater risk than the size of their integration partner."

That is also the way IS Vice President Kevin Godsey saw it when he hired BSG for a multimillion-dollar client/server integration project at Kirby Corp., a $500 million marine transportation company in Houston.

"But we didn't automatically deliver the project to BSG," Godsey added. "We looked at the Big Six firms, but what we found is that they were still struggling to make the transition to client/server themselves."

Still, there is no threat of boutiques surpassing the largest integrators any time soon, according to Bonnie Digrius, an analyst at Gartner Group, Inc. in Stamford, Conn.

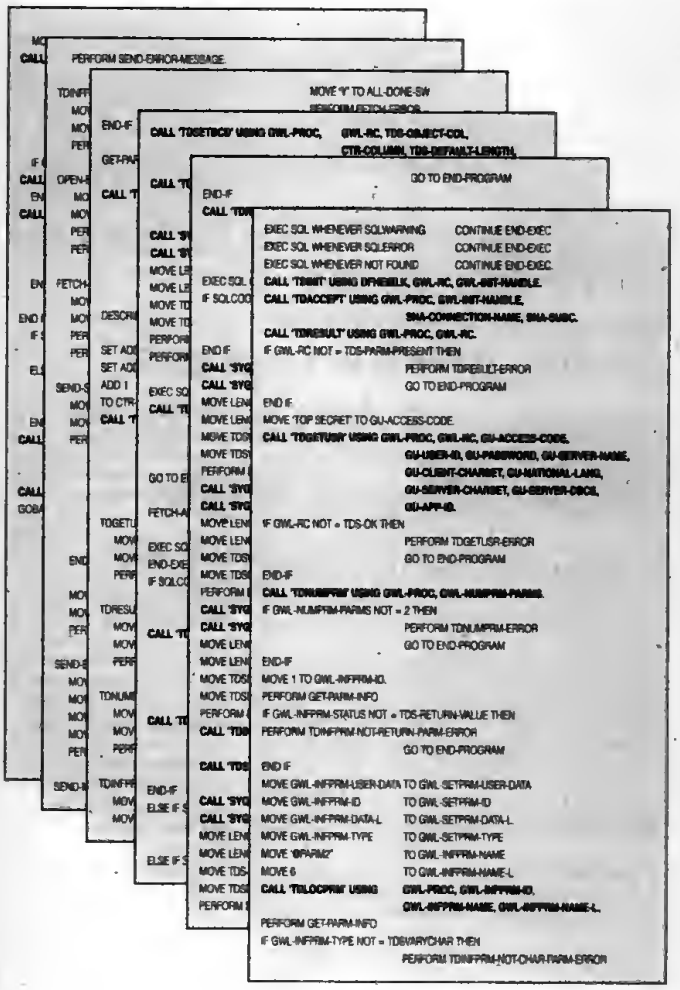
"Right now, there is more than enough work for everybody," she added. "What I see is the smaller firms more nipping at the heels of the larger ones rather than taking market share."

AT&T Solutions moves beyond outsourcing. See page 73.

COMPARE MAINFRAME DATA ACCESS

Sybase

71 lines proprietary code



** Taken directly from Sybase Open/Server Mainframe COBOL Programmer's Reference, pgs. C-3 through C-14 © 1994

Oracle

0 lines proprietary code

This page intentionally left blank

To access mainframe data with Sybase's "Open Server" you must rewrite your existing mainframe transactions and embed dozens of Sybase proprietary interface calls. With Oracle, your existing mainframe transactions run without modification.

The Sybase code on the left queries rows from one DB2 table and returns those rows to the client. This simple query example, taken directly from Sybase's "Open Server/Mainframe COBOL Programmer's Reference" manual, requires you to embed 71 lines of proprietary Sybase gateway code into a 222 line mainframe COBOL program. In contrast, Oracle's "Procedural Gateway for APPC" uses standard IBM APPC interfaces, so you can access mainframe data using your existing mainframe transactions without modification. If you want easy-to-use, standards-based, fast mainframe data access technology call Oracle at **1-800-633-1071 Ext.8118.**

ORACLE
Enabling the Information Age.

© 1995 Oracle Corporation. all rights reserved

Step right up to see Microsoft's latest

Company to demonstrate slew of upgrades at PC Expo

By Stuart J. Johnston

With updates to a slew of key products due to ship by the end of the month, Microsoft Corp. will demonstrate those technologies to users attending PC Expo in New York in two weeks.

No gala launches of those products are planned at the show, but Microsoft officials said they will use the annual PC confab to give users a closer look at the following products before they ship. They include SQL Server 6.0, Visual FoxPro, Windows NT 3.51 and Office 95, a version of the company's productivity applications suite that specifically supports Windows 95, which is due to ship Aug. 24.

High on the list, as far as users are concerned, is a glimpse at SQL Server 6.0, an eagerly awaited update of the company's relational database that will add important replication features.

"Replication services [are] going to open up a whole new world," said Bill Cornfield, president of The Windows Support Group, a consultancy in New York. SQL Server 6.0 "gives you the ability to really, truly distribute databases. Right now, we're bidding on a contract to manage about 20 servers worldwide [for a customer], and it's simple enough that we can do it from New York," he said.

"SQL Server 6.0 is crucial to us," said Arthur Tisi, chief information officer at the Metropolitan Museum of Art in New York. "There are [functions such as replication] in 6.0 that we have absolutely become reliant on."

Also important to users is the pending release of Windows NT 3.51, an update that adds support for IBM and Motorola, Inc. PowerPCs.

"The mere fact that [NT] made it onto IBM's PowerPCs before OS/2 [shows that] it's gaining momentum," said Duncan Davidson, vice president of Gemini Management Consulting, Inc. in San Francisco.

Cornfield, whose clients include the National Football League, Anheuser-Busch Cos. and American Express Corp.'s Gold Card division, said he also looks forward to NT 3.51's improved PCMCIA card support, particularly for clients deploying NT on laptops.

More to come

Also important to users is the debut of Visual FoxPro, a version of the FoxPro desktop database system that adds visual programming capabilities similar to those in Visual Basic.

"Visual FoxPro is important [to us] because we have a lot of Clipper code. [But] it's not as important as SQL Server 6.0," Tisi said. "An update of NT is good because it just becomes more stable."

Other products that Microsoft officials have promised to release around midyear include the following:

- SNA Server 2.11, a minor update that also provides support for PowerPC machines running NT 3.51.
- A minor update to the Systems Management Server that adds support for Windows 95 clients and works with SQL Server 6.0.
- Microsoft Mail Server 3.5, which will finally provide a version of the Mail Server that runs natively under Windows NT.

However, users are not waiting with bated breath for Mail Server 3.5. Instead, they say they are looking for Mail Server's successor, Exchange Server, which is late and now due out by the end of the year.

A Microsoft official said NT 3.51 and updates to NT-based server products are all basically on schedule.

"We're getting awfully, awfully close [to shipping NT 3.51], and the other products are gated by NT," said Collins Hemingway, Microsoft's director of industry marketing at the Business Systems Division.

Because final testing of the server product updates must wait until NT Server 3.51 is completed, one or two products might miss the end of June by "a couple of days or a couple of weeks," Hemingway said.

Integrated "works" packages have some good points. See page 119.

PowerPC players set to make big product splash

By Lisa Picarille

While Apple Computer, Inc. and the IBM PC Co. plan to introduce new PowerPC products on June 19, users will likely find the offerings disappointing, given the lack of native application software for the platforms.

The two companies will unveil their respective and competing PowerPC products in separate announcements in New York, but sources close to both companies expect a unified message: RISC PowerPC is the microprocessor of the future. Lingering software issues, however, may continue to cause problems for users seeking to move to the PowerPC now.

PC Expo to pack PowerPC punch

IBM's systems will initially run Windows NT and AIX operating systems. Users of those machines have the option of receiving a preloaded beta version of OS/2 for the PowerPC.

	Processor	RAM	Hard drive	Slots	Unique features	Price
IBM *PowerSeries 800 desktop systems*	100-MHz 601 or 120-MHz 604	16M bytes	540M bytes	3 PCI (100 MHz 601); 5 PCI, 2 PCMCIA (120-MHz 604)	Dual-speed CD-ROM drive, built-in speakers and microphone (100-MHz 601)	$3,000 (100-MHz 601); $4,500 (120-MHz 604)
IBM *ThinkPad PowerSeries notebooks*	66-MHz 603E or 100-MHz 603E	16M bytes	540M bytes	2 PCMCIA	7.9 pounds, dual-speed CD-ROM drive, built-in microphone (66-MHz 603E)	$5,500 to $7,500
Apple Computer *Power Macintosh 9500 series (code-named Tsunami)*	120-MHz 604 or 133-MHz 604	16M bytes expandable to 768M bytes	500M bytes	6 PCI	Quadruple-speed CD-ROM drive, internal fast SCSI interface	$4,000 (120-MHz 604); $4,600 (132-MHz 604)

Although IBM still has a significant strategic investment in the Intel Corp. architecture, it is expected to unveil its first PowerPC-based systems, including two PCs and two laptops. IBM is also expected to field a 133-MHz, 604-based RS/6000 high-end graphical workstation at the announcement, sources said.

Slow out of the gate

However, IBM's initial PowerPC introduction is long overdue. IBM was slated to ship its PowerPC systems more than a year ago but delayed delivery because of the lack of basic applications for OS/2 and Microsoft Corp.'s Windows NT. A dearth of application software for those platforms still exists and may continue to stifle PowerPC product demand.

Sources close to the PC Co. said IBM was attempting to finish the PowerPC version of OS/2 to ship with the new systems. OS/2 for the PowerPC is now in beta testing and is not expected to be finalized until September. IBM's PowerSeries will initially run Windows NT and AIX. Sun Microsystems, Inc. is porting Solaris 2.5 to the PowerPC.

Apple plans to announce two 604-based high-end desktops aimed at digital video and prepress users, said sources close to both companies.

Since launching the jointly developed PowerPC initiative more than three years ago, Apple has delivered several PowerPC-based Power Macintosh systems and plans to follow the upcoming announcement with a summer rollout of three 601 Power Macintoshes, a 604 Power Macintosh and PowerBooks based on the 603E chip [CW, March 27], according to sources briefed on Apple's plans.

Both IBM and Apple declined to comment.

Heating up

To further fuel the PowerPC fire, Zenith Data Systems will use the PC Expo trade show in New York to demonstrate four new PowerPC-based machines that run AIX and Windows NT, a 604 multiprocessing server, a 604 uniprocessing server, a 604 high-end desktop and a 603E desktop system, sources close to the company said.

And IPC Technologies, Inc. in Austin, Texas, is expected to unveil three Austin PowerPlay systems that will initially run only Windows NT. One system boasts a 604 dual processor, another has a faster 604 processor, and the third is a 603E notebook, sources said.

In the meantime, a handful of companies have been doing their bit to attract attention to the PowerPC. Tatung Science and Technology, Inc., FirePower Systems, Inc. and Motorola, Inc. have already introduced PowerPC systems. Last month, Power Computing Corp. delivered the first Power Macintosh clone.

A total of 2.5 million PowerPC chips are expected to ship this year, more than twice the 1.1 million that shipped last year, according to In-Stat Research, Inc. in Scottsdale, Ariz.

While users are excited by the promise of increased power offered by the PowerPC, some are awaiting CHRP, the Common Hardware Reference Platform that is being codeveloped by IBM and Apple. But CHRP, which is expected to give users a single machine to run their choice of seven operating systems — including OS/2, Windows NT, Windows 95, AIX, Mac OS and Solaris — is not due out until the end of next year, according to Apple officials.

Senior writer Jaikumar Vijayan and senior editor Jean S. Bozman contributed to the story.

IBM eases DOS to OS/2 port. See page 45.

Micro Focus® Object COBOL™

If all the risk was removed, would you still hesitate moving to Object Orientation?

Some people go out of their way to take risks. When it comes to moving your existing application development environment to Object Orientation, risk doesn't have to enter the picture. Object COBOL's fast 32-bit compiler provides encapsulation, polymorphism, inheritance and all the features of a true OO development environment. It also has all the powerful tools you count on from Micro Focus. Object COBOL combines Animator,® Micro Focus' robust editor/debugger, with a powerful graphical Class Browser for an integrated programming environment.

In short, Object COBOL has everything you know and expect from COBOL... and much more. Build understandable, maintainable, object oriented applications at your own pace, without scrapping existing code. Minimize retraining. Minimize risk. Go ahead, make the move to new levels of productivity for your business applications.

See for yourself. Contact Micro Focus at 800 MFCOBOL Ext. 1207 and ask for your copy of the Micro Focus CD. Do it, you'll find descriptions and interactive demonstrations of Micro Focus development tools.

A Better Way of Programming™ **MICRO FOCUS®**

Micro Focus and Animator are registered trademarks and "A Better Way of Programming™" and Object COBOL are trademarks of Micro Focus Ltd.

Telecom overhaul hits roadblock in Congress

By Gary H. Anthes
WASHINGTON

■ An industry coalition promoting network interoperability was dealt a serious blow recently when provisions it favored were eliminated from draft legislation designed to overhaul telecommunications regulation.

The group supported language in the House of Representative's version of the Communications Act of 1995 that would have required the Federal Communications Commission to establish procedures to ensure "effective and efficient interconnection and interoperability of public and private networks." The bill also provided for FCC oversight of development of interoperability and connectivity standards.

Coalition members include industry heavyweights such as Sun Microsystems, Inc., AT&T Corp and Oracle Corp.

But a rival group, which includes Microsoft Corp., IBM and Novell, Inc., protested that interoperability was a red herring disguised as a way for competitors to steal their technology. They worry that the FCC might, in the interest of "interoperability," mandate standards that would effectively force the divestiture of their proprietary technology for free or for license fees set by the government.

They also said the last thing the computer industry needs is meddling by the FCC.

U.S. Rep. Rick White *(R-Wash.) supported Microsoft's position to change legislation*

Less is more

Rep. Rick White, a Republican from the Washington state district where Microsoft is based, persuaded the Commerce Committee to remove both the interoperability language and the mandate for new FCC oversight of standards development. "We already have too many federal bureaucracies and do not need to add a 'Federal Computer Commission' to the list," he said in a statement.

The bill as it is written now does not mention interoperability and says the FCC may work with standards-setting bodies in a way "consistent with prior practice." More broadly, the bill would scrap most cable television price regulation and remove barriers to competition in local and long-distance telephone and cable markets.

The revised bill was approved by the committee and is expected to be passed by the House this summer. A companion bill in the Senate, which has no provisions for interoperability or expanded FCC oversight, could be voted on in the next two weeks.

These changes will not sit well with suppliers such as Rick Dahlgren, a vice president at Cottonwood Communications in Omaha, who said the government should work harder to ensure open networks and interoperability. He said Cottonwood wants to offer various digital video services to home users, but it has been thwarted by US West, Inc., which said the interface specifications to the "set-top box" — a computer — that is needed to process the signals is proprietary.

As a result, users of Cottonwood services would have to buy an additional box for more than $1,000, Dahlgren said. "This flies in the face of everything that has to do with common carriage, such as the requirement for nondiscriminatory access," he added.

Dahlgren said an antitrust suit against US West is grinding through the legal process, but he wryly predicted that "we'll be successful posthumously."

The Computer and Communications Industry Association (CCIA) in Washington continues to support the stricken interoperability provisions. "We are on [Capitol] Hill trying to induce changes in the legislation in both chambers," said Marc Brailov, a policy analyst.

Brailov said although the CCIA believes the government should play a role in ensuring interoperability, it should leave development of standards to industry.

When asked what the FCC should do, Brailov said, "We are mulling that over. We want to see what is politically feasible."

This year the answer may be "not much." Last week, the Washington think tank Progress & Freedom Foundation, which has close ties to House Speaker Newt Gingrich (R-Ga.), proposed that the FCC be abolished.

News Shorts

Kodak ends Digital deal, signs new outsourcing pacts

Eastman Kodak Co. signed separate five-year outsourcing agreements with IBM's **Integrated Systems Solutions Corp.** and **Northern Telecom, Inc.** to manage its corporate networks. Kodak's contract with **Digital Equipment Corp.**, which had managed the company's data and video networks since 1989, was not renewed. Under terms of the new deals signed last week, ISSC will manage Kodak's data networks, and Northern Telecom will take over all voice and video communications in the U.S., including Kodak's internal television network and videoconferencing facilities.

Convex upgrades supercomputer

Convex Computer Corp. today is scheduled to unveil an upgrade to its scalable supercomputer based on **Hewlett-Packard Co.**'s PA-RISC 7200 processor. The SPP1200, a parallel processing system that scales up to 128 processors, runs about 35% faster than the current SPP1000, company officials said. Richardson, Texas-based Convex and Palo Alto, Calif.-based HP will sell the system, which ranges from $160,000 for a two-CPU system to $8 million for a full-blown 128-processor model.

3Com expands switch

This week, **3Com Corp.** in Santa Clara, Calif., will introduce two new modules for its LANplex 6000 high-end switch designed for use in data centers. 3Com's Ethernet/Fiber Distributed Data Interface (FDDI) Switching Module and Token Ring Switching Module feature next-generation application specific integrated circuit technology designed to increase the switch's versatility. The Ethernet/FDDI module, priced at $18,000 for 18 ports, is shipping now. The Token Ring module will cost $13,500 and ship in September.

EDS woos rival A. T. Kearney

Electronic Data Systems Corp. last week revived its original bid to acquire consulting rival **A. T. Kearney, Inc.**, which rejected an EDS offer last month. In a joint statement issued last week, the companies said that if the offer — reportedly valued at about $600 million — is accepted, "it is expected that EDS's management consulting business would merge with Kearney to create an EDS-owned management consulting subsidiary." Chicago-based A. T. Kearney employs 1,900 consultants worldwide.

Trio teams up for on-line banking

Three regional banks have joined forces to create the first full-service, Internet-accessible retail bank. The partners, **Wachovia Corp.** in Winston-Salem, N.C., **Huntington Bancshares** in Columbus, Ohio, and **Area Bancshares Corp.** in Owensboro, Ky., have agreed in principle to create a unit called Security First Network Bank (http://www.sfnb.com). Last month, **Wells Fargo Bank** in San Francisco became the first retail bank to provide customers with on-line access to checking, savings, line-of-credit and credit-card accounts.

Repetitive injury concerns mount

What do professional worriers worry about? A survey of more than 2,000 corporate risk managers found that repetitive stress injuries suffered by computer keyboard users and factory workers ranked No. 4 on their list of concerns. The survey, conducted by New York consultancy **Alexander & Alexander Services, Inc.**, ranked tort reform and spiraling health care costs as the highest priorities.

SGI goes Hollywood

Silicon Graphics, Inc. and **DreamWorks SKG**, the Los Angeles movie studio spearheaded by Steven Spielberg, last week announced plans to jointly develop computer animation systems based on SGI technology. The companies plan to spend roughly $50 million to create a studio system that can develop, manage and store high-end computer animation graphics for use in movies and videos. The system, Digital Animation Dreammachine, or DAD, is scheduled for a September 1996 premiere.

Beefing up notebook storage

Integral Peripherals in Boulder, Colo., has introduced 720M-byte and 1G-byte quarter-in. disk drives for high-end notebook computers. The drives were designed to suit the growing storage capacity needs of mobile computer users. OEM single-quantity evaluation units are available now at $595 for the Platinum/720 and $795 for the Platinum/1010.

Chip doing double duty

Chip maker **Advanced Micro Devices, Inc.** this week will announce a 120-MHz 486 chip that it claims will deliver the same performance as a 75-MHz Pentium chip. The chip is aimed at the desktop and portable markets. Shipments will begin in the third quarter.

UPS delivers in Europe

United Parcel Service of America, Inc. plans to inject more than $1 billion into its European operations over the next five years in an effort to strengthen its regional activities there. The plan includes a $200 million investment in information technologies.

SHORT TAKES IBM has purchased **Footprint Software, Inc.**, which specializes in financial applications for banks. Footprint in Toronto employs 230 people and had $25 million in revenue last year. ... **Barclays Bank** in London, **Netscape Communications Corp.** and **Sybase, Inc.** are developing a secure credit-card transaction environment for Barclays' on-line mall, which is located at http://www.itl.net/barclaysquare.... When the top leaders of the industrial world meet June 15-17 in Halifax, Nova Scotia, to engage in high-level economic and trade discussions, they will use **Fujitsu Personal Systems, Inc.** pen-based tablet computers.

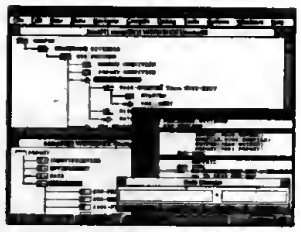
It's simple to get a self-running demo and a free copy of The Secret Of COBOL Maintenance. Just call 1-800-434-REAL.

Compared to the competition, CA-Realia II Workbench is twice the product at half the price.

$2,500
For A Limited Time.

Fully integrated, intuitive programmer's workbench	✓	
Debug both PC and mainframe-based programs	✓	
Fast compiles and efficient execution	✓	
Complete single-vendor solution	✓	
Supports Windows and OS/2	✓	
Foundation for GUI Client/Server COBOL development with open DBMS access	✓	

The competition simply can't compete with CA-Realia II Workbench.



The point-and-click debugger simplifies testing.

"It's easy to use. And that makes me and my staff a lot more productive."

FAME Awards

Awarded the Federal Applications Medal of Excellence.

- GUI Editor
- GUI Interactive Debugger
- GUI Program Analyzer
- CICS Emulator Included
- Version Control Included
- Fastest PC COBOL Compiler*

Avoid That Empty Feeling. Get The One COBOL Solution That's Fully Loaded.

Compared to CA-Realia® II Workbench, other COBOL development solutions come up empty – unable to compete with the most comprehensive client/server tool in the industry.

One that provides an unsurpassed list of benefits and features which include: the world's fastest PC COBOL compiler, a GUI editor and an interactive GUI debugger for code executing on a PC or mainframe, and integrated lifecycle management. Plus a COBOL-intelligent program analyzer that's the smartest thing you've ever seen.

What's more, CA-Realia II Workbench includes a complete mainframe CICS emulator for no extra charge. And, all the features of the workbench apply to CICS programs as well as batch.

So whether you're in a Windows or OS/2 environment, CA-Realia II Workbench provides complete integration with your host-based systems. Which means unlike some other COBOL solutions, your programming choices are never limited.

For A Self-Running Demo And A Free Copy Of The Secret Of COBOL Maintenance, Call 1-800-434-REAL, Dept. 26102.

You'll see when it comes to COBOL client/server development solutions, only one has been fully developed: CA-Realia II Workbench.

COMPUTER ASSOCIATES
Software superior by design

CA-Realia® II Workbench
The Complete Client/Server COBOL Solution

© Computer Associates International, Inc., Islandia, NY 11788-7000. U.S. dollars. Offer good in U.S. and Canada only. All product names referenced herein are trademarks of their respective companies. Awarded by *Government Computer News*, March 25, 1994. *Source: *Computerworld* Buyer's Scorecard March 25, 1991

DCE software delays disappoint users

By Craig Stedman
BOSTON

Most of the key features planned for an upcoming version of the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) software have been delayed from this fall to mid-1996, and some expected enhancements have fallen by the wayside altogether.

That was the unhappy news delivered to corporate users at the OSF's annual members meeting here last week. While a subset of DCE 1.2 will still be available to systems vendors in November, the most eagerly awaited features, such as coexistence with Novell, Inc.'s NetWare, will now ship in a second release due in mid-1996 (see box).

DCE is a set of middleware for distributing applications across multiple platforms, from PCs to mainframes. The technology is viewed as one of the leading options for connecting departmental islands into a seamless computing environment, although it has been adopted more slowly than proponents had hoped.

Early users who attended the OSF members meeting said they remain bullish about DCE. But they added that the phased release schedule means systems vendors will probably not be able to offer the full DCE 1.2 to customers until late next year.

"It would be nice to have it there sooner," said Paul Frisch, a systems engineer at Electronic Data Systems Corp.'s client/server technology services unit in Troy, Mich. EDS is implementing DCE at parent company General Motors Corp., and getting NetWare support would eliminate the need to have TCP/IP protocol stacks on GM's PCs to connect them to Unix systems, he said.

The phased approach is "a disappointment in that we need as much DCE as we can get as fast as we can get it," said J. Steven Jenkins, information systems task manager at NASA's Jet Propulsion Laboratory in Pasadena, Calif. The lab, a heavy NetWare user, plans next year to put core DCE services in place that it hopes individual LANs could access, he added.

The delay was caused by protracted haggling over joint development contracts between project leader IBM and other participating vendors, sources said. Development plans were supposed to be finalized last fall, but the contracts did not get signed until April, the sources added. DCE 1.2 is the first release controlled by a group of vendors instead of OSF staff.

In addition, sources said an agent for linking DCE with management tools based on the industry-standard Simple Network Management Protocol (SNMP) was left out of the final DCE 1.2 plan. SNMP support, which is required to enable nearly all network management software to query the status of DCE systems, is now targeted for a future version, the sources said.

The management capabilities an SNMP agent would provide for DCE are badly needed after the collapse of the OSF's effort to develop a companion Distributed Management Environment, said Michael McGlynn, a technical staff member at Mitre Corp.'s software engineering center in Eatontown, N.J.

What and when

The initial DCE 1.2.1 release, due to ship to systems vendors in November, will include a Network File System gateway and C++ language support, OSF officials said. The follow-on DCE 1.2.2 should be ready next June and will add file access and administrative support for NetWare clients. It will also include compatibility with public key encryption mechanisms and a single-threaded version of the DCE remote procedure call technology.

You need to make decisions. You need facts, not guesses. Right now. On the screen. Organized. Current. Complete. That's what business intelligence is all about. And that's what Pilot Software does better than anyone in the world. LightShip is the most powerful and comprehensive OLAP solution available. Its state-of-the-art technology transforms corporate data into the insights you need to make the best decisions possible. Easy to use and customize, LightShip is ideal for sales tracking, marketing analysis, quality monitoring, financial reporting, and more. With Pilot you'll get the decision-making power you need to compete and win. Call 800.944.0094 or 617.374.1194. In Australia/Asia, call 02.975.2380. In the U.K., call 01.932.569944.

Pilot Software
a company of The Dun & Bradstreet Corporation

I Want Power, Features And Reliabil
I Want It All.

You Ca

Z-NOTEFLEX.

POWER

High-speed processors to 100MHz

Large TFT and passive color LCDs

High-capacity 700+ MB hard drives

Fast local bus video and hard drives

Up to 6 5 hours of battery life*

FEATURES

User-upgradable CPU, HDD and LCD

Swappable floppy for second battery

Lockable modular components

Integrated 16-bit audio

Two Type-II PCMCIA slots†

Integrated pointing device with oversized buttons

FLEXDOCK™** enhanced port replicator with networking and expansion capabilities

FLEXSHOW™** multimedia accessory unit with double-speed 5 25" CD-ROM drive

RELIABILITY

PC Tools™ anti-virus software loaded

24 hr-7 day toll-free customer support

3-yr limited warranty (first year on site)

If you have a number of needs, look to the computer that offers a number of solutions Z-NOTEFLEX™ It's what you want in a notebook

1-800-289-1320 Ext. 5174
http://www.zds.com

ZENITH DATA SYSTEMS

Make The Connection™

Z-NOTEFLEX, FLEXSHOW, FLEXDOCK and "Make The Connection" are trademarks of Zenith Data Systems Corporation. Intel®x86 PC Tools is a trademark of Central Point Software, Inc. *Figure based on two-battery configuration. Battery life depends on applications. †Installment Type-I, Type-II and Type-III PCMCIA slots are available with optional modules. Specifications are subject to change.

Lannet offers virtual network management

Users get simultaneous monitoring

By Michael Fitzgerald

LANs, like reality and corporations, are going virtual. But the big question is, how will they be managed?

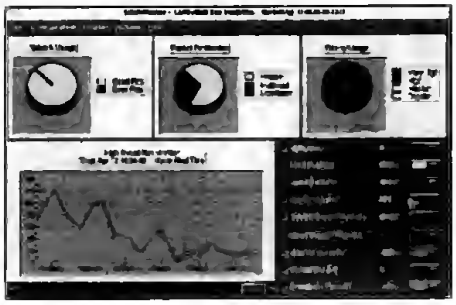
Israeli firm Lannet Data Communications Ltd. is among a pack of vendors fighting for the No. 3 slot in the worldwide switching hub market behind Cisco Systems, Inc.'s Kalpana unit and 3Com Corp. Today Lannet will announce a combined software/hardware product that lets users implement Remote Monitoring (Rmon) for virtual switched networks.

Firms are able to put users on these networks without physically moving wires and cables around. Virtual networks are expected to become increasingly important to large companies with distributed workforces.

A leg up

Lannet's SMonMaster software and NMA-RS network management module, both shipping this month, were designed to give users full network management capabilities for all ports on a switched virtual network. Analysts said these features will gain Lannet at least some edge in the market because of their ability to simultaneously monitor all traffic on a virtual LAN.

"This could open eyes at other vendors or could let Lannet be accepted as a major player for the first time," said Skip MacAskill, an analyst at Gartner Group, Inc. in Burlington, Mass.



Lannet's SMonMaster *features graphical tracking of bad packet ratios, packet destinations and usage types*

MacAskill said for virtual LANs to function efficiently, the network manager must have a way to troubleshoot and provide some basic management, such as traffic patterns and error-generating information. He said Lannet would be "the first to pull this off, provided that they actually deliver it."

MacAskill said other switching hub makers with Rmon capabilities, such as Alantec Corp. or 3Com, can provide only time snapshots of network traffic, while Lannet will give real-time monitoring.

One user said Lannet's software will tet his company move to switched virtual LANs.

"For us, if something goes wrong in a switched network, especially since we're going to start using virtual nets, I can't communicate anymore," said Joe Andres, network manager for the control centers network at Bonneville Power Administration in Vancouver, Wash. Bonneville Power has two networks 300 miles apart and has considered switching before, but the utility was unable to get the level of management capabilities it considered crucial to keeping the network running.

The utility has roughly 15 Lannet switches, installed five years ago, that support the NMA-RS cards. Andres said that although he uses Lannet's proprietary modules and will have to use 100Base-T wiring, he does not consider it a major drawback.

The SMonMaster software will cost $3,995. The NMA-RS module, based on an Intel Corp. i960 RISC processor, will sell for $7,995. The hardware works only with Lannet's switching hubs but modularly plugs into them.

While Lannet looks to have an early lead in managing switched virtual networks, it has little presence in the U.S. "Their story sounds great; the only negative is ... they're nowhere in the U.S.," said Paul Weinstein, a first vice president at PaineWebber, Inc. in New York.

DG on thin ice

CONTINUED FROM COVER 1

DG may be close to making a major strategic announcement that will address these concerns, but so far, the Westboro, Mass., company has remained mum.

"The user group is going client/server," said David Novy, product data management specialist at 3M Co. in St. Paul, Minn. "DG isn't going with them." He added that DG faces "a slow death by strangulation" unless it does something dramatic.

"They've got the finest piece of iron on the market, but the applications aren't there," Novy added.

Novy rattled off a list of software, including data management, computer-aided design and even the popular Notes packages, that does not run on DG's Aviion boxes. He also complained that DG is weak when it comes to client/server applications.

Like many users, Novy said he is waiting to see what DG plans to do in terms of settling on a new chip. "They're running out of life on the 88K; nobody writes for it," he said.

Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass., agreed. He said DG has "ridden the 88K as far as they can" and has to choose essentially between Intel Corp.'s Pentium, Hewlett-Packard Co.'s PA-RISC or the PowerPC chip.

What about software?

"We're all curious," said Tim Boyer, data processing manager at Denman Tire Corp. in Cleveland and a past NADGUG president. He too wants DG to address the ongoing concern about software availability.

But not everyone can wait. Michael Crowell, information technology manager for the city of Salisbury, N.C., once had three DG MV computers and four Aviions. All are gone except for one MV, which will be shipped out next week, Crowell said.

When software developers stopped writing for the proprietary MV line, Crowell said he began exploring new options. He found that moving to a PC-based network reduced costs and improved access to applications.

"The machines never gave us a problem," Crowell said. "It was getting software to run on them."

Jerry Waldon, systems manager at Pictorial, Inc. in Indianapolis, is a 12-year DG customer.

A DG's life

1989	Data General unveils servers and workstations based on Motorola 88000 RISC processor
1991	Data General stands alone as major hardware players shun the 88000
1993	Data General announces second-generation servers based on Motorola 88100 chip
1994	Motorola ships PowerPC
1994 to present	Anxious Data General users press company for chip direction

He said he wants DG to improve integration between the Unix implementation and Microsoft Corp.'s Windows NT.

Furthermore, Waldon said he wants to hear how DG plans to lure software makers to port their products to DG/UX. He pointed to Notes as an example. "Those are the products the world is standardizing on. We need to know are we going to be able to run them on the DG platform," he said.

Steve Pounds, controller at Security Forces, Inc. in Charlotte, N.C., and NADGUG president, said a meeting — the first of its kind outside of the annual user group session — is being arranged between user group members and DG executives.

Notes delay no biggie

By Suruchi Mohan

Unlike Microsoft Corp. Mail administrators, who are having a hard time keeping their systems up and running while they wait for Exchange, Notes 3.0 users are waiting patiently for the delayed Version 4.0.

Despite a promised June delivery, Lotus Development Corp.'s Notes 4 will not be available until year's end, a source said. In April, Lotus moved the shipment date to the second half of the year.

Additionally, Lotus revised the ship date for NotesView, the management tool based on Hewlett-Packard Co.'s OpenView platform, from the end of the first quarter to the last week in June.

The delays are not significant, according to a Lotus spokeswoman. "There is no specific reason for the changes; it is just the nature of software," she said.

Not much change

Unfazed users appear to be taking the six-month delay in stride. The reason is that although Notes 4.0 offers some interesting features, it is essentially the same as the current product, according to Bob Barmack, director of operations at Young & Rubicam, Inc. in New York.

The same is true for NotesView. Although it is a new product, it offers features that are already available from third parties, he said. NotesView will offer central administration capabilities, and Notes sites are using third-party utilities right now. Even though the utilities are "not as good as NotesView, [they] help us get by," Barmack said.

But with Microsoft's Exchange, Mail users face a brand-new product with new capabilities.

"We are interested in the features of Notes Version 4.0, but there's nothing there we're living and dying on," Barmack said. "Some of the features, like [CommServer], would take some time to examine anyway."

Walter Kuleck, managing director at Technology Enterprises, Inc., a consultancy in Cleveland, agreed. "People committed to Notes are religious in their fervor," he said, adding that a six-month delay will not alter those people's plans, nor will it make them switch platforms.

"We will be migrating to Version 4, but at this time, if it's delayed 'til the end of the year, it [won't] adversely affect us," said Kevin O'Brien, director of the information and technology center group at Price Waterhouse in Tampa, Fla. "We're obviously anxious to make use of the features of Version 4, but with our 35,000-plus users worldwide, we have to take a cautious approach," he said, noting that a lot of interoperability testing is required before rollout.

Novell promises a client/server groupware package. See page 49.

Thanks to Sprint Business, Rail Europe increased its speed to 256 kilobits per second.

Real Problem. Rail Europe, the exclusive sales agent for most European railways, needed a way to offer their huge database of schedule and fare information to travel agents all over the world.

Real Solution. Sprint Business put them on track with SprintNet,® the world's largest public data network, with access from 45 countries. What's more, with X .25 packet switching and highly reliable access at up to 256kbps, Rail Europe has quickly become the only stop for thousands of travel agents in the U.S., and as far away as Japan and Australia. All they need is a PC and the price of a local call to book virtually any train in Europe and the former Soviet Union. 24 hours a day. Sprint Business technology helped Rail Europe. Let us help *your* business do *more* business.

Sprint. Business

1-800-669-4700

©1995 Sprint Communications Company L.P.

Netscape offers one-stop Internet sign-up

Commercial edition will lure Internet neophytes

By Ellis Booker

The wildly popular Navigator browser, once available only to the Internet-initiated, will soon appear on retail shelves near you.

The $39.95 Netscape Navigator Personal Edition for Windows will include a one-button feature that will enable new users to choose among several national Internet access providers, set up an account and immediately begin exploring the Internet.

"It delivers the dynamic world of the Internet to anyone with a PC and a modem," said Marc Andreessen, co-founder and vice president of technology at Netscape Communications Corp. in Mountain View, Calif. The Personal Edition will be available from Netscape, computer retail chains, resellers and OEM channels.

When Netscape burst onto the Internet with a downloadable browser for the World-Wide Web last October, many wondered how the start-up could stay in business with a "free" product. Today, Navigator is the runaway favorite among Web surfers, accounting for more than 75% of browser traffic on the Internet. Meanwhile, privately held Netscape claims a healthy business in licensed sales of its browser and server products.

"The wisdom of what they did is reflected in their dominant market share," said Jeffrey Tarter, publisher of "Soft Letter," a newsletter in Watertown, Mass. He said that while Netscape spent virtually nothing on advertising, it swiftly obtained market dominance over the likes of IBM, which heavily promoted Internet access features in its OS/2 Warp product.

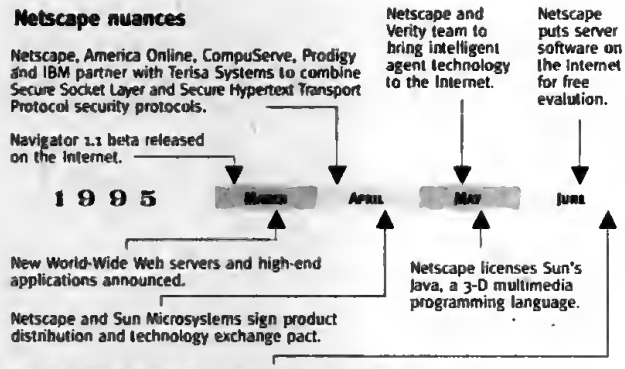
But Amy Wohl, editor of "Trends-Letter" in Narberth, Pa., said Netscape and other vendors of Internet access software will soon confront Internet connectivity included in operating systems and popular applications.

When this happens, Wohl predicts, the browser market will consolidate. "We don't need 300 mediocre ones; we need three good ones," she said. Netscape's pursuit of both direct sales and OEM channels bodes well for it, Wohl added.

Netscape is also adding unique capabilities to its stand-alone product, such as a multimedia player from Macromedia, Inc. (see story at right).

New retail products *may bring many more users to Netscape's home page*

Netscape nuances



Pick one

The Personal Edition includes one-button access and sign-up with the UUNet, Portal, Netcom and MCI Communications Corp. service providers. Netscape is also negotiating with several other Internet access providers.

Financial arrangements between Netscape and the providers were not revealed, but a Netscape source confirmed that those vendors are paying Netscape a "bounty" for new subscribers. The software includes 90 days of technical support from Netscape and ongoing support for the product from the service provider.

Also last week, Netscape added an online distribution scheme for its popular Web servers.

The Server Test Drive Program lets potential customers download and use the just-released 1.1 Communications and Commerce server products for a 60-day trial.

Customers will have to fill out an online registration form, and Netscape said it intends to send "soft" reminders to downloaders who do not pay for the servers within the 60-day trial period. Unix servers cost between $1,495 and $5,000, and Windows NT servers cost $795 to $2,995.

Multimedia views

Macromedia will announce this week that it is supplying an integrated multimedia player in the next release of Netscape's Navigator World-Wide Web browser. The integrated player, code-named Shockwave, will permit on-the-fly viewing of multimedia titles through Navigator.

The player software will also be available with every copy of Director, according to a spokesman for San Francisco-based Macromedia. In addition to the Netscape browser, the Director playback engine supports PCs (Windows, Macintosh and OS/2 Warp) and emerging interactive television platforms.

Separately, Macromedia said it would launch a Web site that will offer mostly non-Macromedia information. "We want to be a real service to multimedia developers," said Miles Walsh, vice president of marketing. He said the site would include news and feature how-to articles for multimedia developers from a number of sources. It can be accessed at http://www.macromedia.com. —*Ellis Booker*

Internet phone device unlikely threat to telcos

By Suruchi Mohan

VocalTec, Inc. in Northvale, N.J., this week will announce the fully duplexed version of its Internet Phone, a device that lets PC users communicate orally over the Internet for the price of a local telephone call. But it may encounter some static in its effort to build a market.

Tom Maresca, an analyst at Jupiter Communications Ltd. in New York, said many people are wondering if the product will pose a threat to telecommunications companies. But there is no danger of that, he said, because Internet Phone is "still for the Internet hobbyist." Latency — the delay in receiving the transmission — is still a hindrance and does not make for smooth conversations.

Critics are already complaining that the product misses the mark by too closely mirroring speakerphones and their problems. Jack Gold, an analyst at Meta Group, Inc. in Stamford, Conn., said Internet Phone lacks several features that would make it suitable for business use, such as multipoint conferencing and information sharing.

Speakerphone-quality

"In a business setting, people won't get on the Internet to talk" orally, Gold said. He added that Internet Phone is not exactly fully duplexed, which would allow for simultaneous transmission of data in both directions.

He equated it to a speakerphone, which does not handle people interrupting one another well and has a delay between the time one person stops talking and the other person hears the voice.

Another factor limiting the business use of VocalTec's latest version is that users have to be logged on at the same time to reach one another, Gold said. But it is good for those in the business of providing internet services, Maresca said. For example, as people get more involved with the World-Wide Web, a service/support firm could use it to let users call in with problems while browsing.

Gold predicted that Internet Phone will find its way to many PCs because NetCom, an Internet services provider, is distributing it with its NetCruiser tool.

Linux turns into a World-Wide Web surfer. See page 68.

AOL acquisition

In a surprise move late last week, American Online, Inc. acquired Global Network Navigator, one of the most established Internet locales, for $11 million. Many expected AOL to add Internet access the way CompuServe, Inc. and Prodigy Services Co. have. Prodigy delivered a Web browser capability early this year, and CompuServe followed with a Web browser from Spry, Inc., which it acquired earlier this year for $100 million. By picking up Global Network Navigator, AOL can claim 180,000 registered subscribers.

—*Ellis Booker*

FCC inks ISDN price-cut plan

By Michael Fitzgerald

Winning rare praise for prompt action, the Federal Communications Commission last week released a proposal intended to push down pricing on Integrated Services Digital Network (ISDN).

The FCC also said it will not enforce its recent decision that ISDN vendors must charge a per-channel rate for services. "This decision [not to enforce the rate ruling] was amazing in its rapidity," said Jim Burger, director of government affairs at Apple Computer, Inc. The FCC issued its ruling on per-channel rates for ISDN just two months ago.

The FCC's rule-making proposal, rather than dictating to the industry, is meant to solicit comments from the industry and consumers about the best ways to lower ISDN rates.

Possible FCC rules

- One line charge per ISDN line, instead of multiple charges
- Rate line costs based on a ratio that compares to local lines or T1 lines (depending on the ISDN service)
- Flexible rates if long-distance charges don't rise

Kathleen M. H. Wallman, chief of the FCC's Common Carrier Bureau, stressed that both business and residential consumers should benefit from lower-priced, easier-to-get ISDN services.

The computer industry rallied behind the FCC's efforts, saying that ISDN could spur multimedia use. "We're quite heartened, and we think the industry ought to get together so that 10 to 20 times the number of ISDN lines installed last year get installed," said Mike Maibach, director of government affairs at Intel Corp.

ISDN is potentially important to users as well as vendors because it allows telephone lines to carry substantially more information than regular analog phone lines. ISDN can carry data at 128K bit/sec., while standard phone lines now are only beginning to achieve 28.8K bit/sec. rates.

Room for improvement

Long touted as a way for companies to gain much higher throughput rates without completely revamping their networks, ISDN has yet to fulfill its potential. The digital network has a less than 70% penetration rate at the telephone switch level. Besides pricing that varies from state to state, users have also had to endure varying levels of ISDN proficiency at telephone companies.

Because the FCC does not control ISDN pricing at the state level, its direct impact on pricing is limited [CW, May 15]. Its influence is significant, however.

Some users are considering ISDN even at current prices.

Buck Guery, a computer technician at the College of Charleston in Charleston, S.C., said the college is looking to install ISDN lines between its campuses to gain more effective terminal access for off-site users.

"For individual use or home use the costs are way too high, but for us it's not bad," Guery said. Rates in South Carolina include a $250 installation fee and a basic rate of $90 a month. These rates appear to be more cost-effective than leased 56K bit/sec. lines or T1 lines, Guery said.

The FCC also wants telephone companies to make it easier to install ISDN, a bugaboo for many users.

One telecommunications company responded promptly to the FCC's new rule-making proposal. Bell Atlantic Corp. cut usage fees on ISDN from 5 cents a minute to 2 cents a minute the same day the proposal came out.

The FCC's Notice for Proposed Rule-Making sets a June 29 deadline for comments and a July 15 date for replies to those comments.

Imagine trying to predict the impact of PC application software in 1975. It would have been nearly impossible to foresee the full power of word processing and spreadsheet programs that are now so ingrained in contemporary work culture.

Twenty years later, we are on the threshold of another revolution in computing technology. It's called "Groupware."

Until recently, computer technology has mainly served to automate transaction-based, back-office applications or to improve personal productivity. Tools to manage the rich variety of document-oriented information — which is the lifeblood of most business processes — simply didn't exist. The limitations of technology stifled teamwork rather than encouraging it. Groupware resolves these dilemmas.

So, what is groupware? Groupware is software that uniquely enables organizations to communicate, to collaborate, and to coordinate key business processes. Groupware encompasses electronic mail, but goes far beyond messaging to act as an integrated platform for the development and deployment of a new class of client/server applications — applications that structure the flow of both structured and unstructured information in business relationships — among teams, across an enterprise, and between companies.

Groupware is so compelling because it allows businesses to create an organizational memory and share knowledge and expertise across time zones, geographies, and networks. It draws together the collective intelligence found in unstructured information sources like word processing documents, electronic mail messages, and faxes. Companies using groupware find that the barriers to high-performance teamwork that have plagued them fall away. According to International Data Corporation, groupware signals the second wave in desktop computing.

At the same time, this emerging software category has become a source of confusion. Technology buyers sometimes mistake a component of

groupware for the whole. Corporations are making enormous investments in messaging technology, unaware of the additional benefits of an integrated messaging and groupware infrastructure.

Groupware must combine three essential elements to be viable:

A reliable, scalable and secure distributed document database. The database-centric model gives users the ability to assemble, share, and manage the rich variety of documents vital to conducting business — business plans, contracts, orders, product information, calendars and to-do lists, multimedia presentations, faxes, scanned images and video clips.

An integrated messaging system. Groupware users must be able to take advantage of a messaging infrastructure to send and receive electronic mail and move documents through a workflow process.

A rich application development environment. Developers must be able to rapidly build portable and scalable strategic applications which span document-oriented and structured database information.

Applications designed with these components can deliver mission-critical, enterprise-wide results like slashing product development cycles, enhancing relationships with customers, and automating a sales organization for greater productivity.

Only one groupware product provides all of these capabilities. Lotus® Notes.® Lotus invented groupware. We have invested 10 years of research and development and have six years of experience in this market. More than 1½ million users in 5,500 companies are reaping the benefits of Notes, and over 9,000 Notes business partners are helping customers develop winning applications. Notes customers have achieved an average R.O.I. of 179%.*

In the coming months, we will use this forum to explore the issues around groupware. Our goal is to ensure that you make successful investments in this important product category.

Lotus
Working Together®

*For more information, call 1-800-828-7086 ext. A829 or explore Lotus on the World Wide Web at www.lotus.com. © 1995 Lotus Development Corporation. Lotus, Lotus Notes and Working Together are registered trademarks of Lotus Development Corporation. ® Lotus Notes. *Source: International Data Corporation, 1994. 2 Red

Internet tramples legal jurisdictions

CONTINUED FROM COVER 1

dated laws. It is also making it tough for users and authorities to figure out which jurisdiction's laws apply.

Corporate information systems departments can try to shield their companies from liability by writing internet usage policies that forbid defamatory statements. They can also take more aggressive action by shutting off access to nonbusiness portions of the Internet, said Charles L. Johnson, information systems security architect at Cummins Engine Co. in Columbus, Ind.

Across the board

But Johnson noted that keeping up with the various laws is a major headache. "For starters, I'd like to see uniformity [of computer abuse statutes] among the 50 states and our neighbors north and south of the U.S. border," he said.

Gambling laws, for example, were not drafted with the borderless, global Internet in mind. Nor did their authors contemplate the emergence of electronic cash, which can be sent anywhere in the world instantly and anonymously. Law enforcement officials say it is unclear how the law applies to offshore, Internet-based casinos. Enforcement, they acknowledge, would be difficult in any case.

Yet last month, the Texas attorney general said any Texan who bets electronically on a "publicly accessible" on-line service is breaking state gambling laws.

"How do you preserve boundaries when you've got a technology that transcends them all?" asked Barry Weiss, a partner at the computer law firm Gordon & Glickson in Chicago.

A scathing on-line message that may be protected in the U.S. under the Constitution's First Amendment, for instance, could be considered libelous in the UK, Canada or Australia, which are less permissive about free speech.

"With libel, the harm occurs where the message is read, but on the internet it could be read anywhere, so the court venue is proper anywhere," said Dan L. Burk, a cyberlaw expert at George Mason University School of Law in Arlington, Va.

The transborder nature of on-line traffic means that an aggrieved party or prosecutor can pick the jurisdiction with the toughest law against a particular conduct, a practice known as "forum shopping."

Out of practice

One of the legal barriers to telemedicine, a much-touted application of the information superhighway, is the question of whether a physician consulting with a patient in another state should be licensed in that state. Last year, Kansas required out-of-state physicians to be licensed in Kansas if they use telemedicine to treat in-state patients.

Sexually oriented material — *on-line or otherwise — is prohibited in many countries*

A classic case involved the Milpitas, Calif.-based Amateur Action computer bulletin board, which had explicit scenes of bestiality and sexual fetishism. Last year, after a U.S. postal inspector in Memphis downloaded the images, the owners were convicted of transmitting materials deemed obscene under the Bible Belt community standards in Tennessee. The case is under appeal.

Penthouse magazine's World-Wide Web site illustrates the international dimension. The opening Web page warns visitors to stay away if they are offended by adult sexual material or are "accessing *Penthouse* Internet from any country or locale where adult material is specifically prohibited by law."

Penthouse then lists 25 countries that outlaw such material, including Egypt, India, Japan, Korea, Mexico, Saudi Arabia, Spain and the UK.

As for Internet Casinos, Warren Eugene, owner of the Toronto-based company, claimed that he has sidestepped legal problems by licensing casino operations to the governments of the Caribbean islands where the gambling servers will be set up.

For example, the St. Maarten operation will be legally owned by the Netherlands, with the "house" cut going to that country. Eugene will receive a royalty from the Netherlands, he said. Therefore, any legal disputes would be between countries, in this case the U.S. and the Netherlands, Eugene explained.

But it is not really that simple, said Scott Charney, chief of the Computer Crime Unit of the U.S. Department of Justice.

Charney said the Justice Department is looking at how existing laws might relate to Internet-based gambling, but he would not comment on whether the agency plans to prosecute Internet Casinos or U.S.-based customers.

In the long term, the jurisdictional disputes will have to be resolved through updated laws, court decisions and international treaties, Burk said. "There will be a lot of chaos and yelling until then."

The U.S. is ill-prepared for electronic attacks. See page 55.

Prodigy ruling

CONTINUED FROM COVER 1

nity. Other on-line networks have successfully defended against libel judgments in the past by arguing that they do not make editorial decisions about the content on their networks.

Yet now a number of observers are worried the ruling could have a chilling effect on the businesses that are joining the Internet in droves.

"It'll impact all providers of on-line services, whether they be bulletin boards on commercial services or [commercial businesses] with Internet-based services," said Kent Stückey, formerly general counsel and now director of product marketing at CompuServe, Inc. in Columbus, Ohio.

To protect themselves, commercial customers that establish a corporate on-line presence or permit employees to cruise the Internet should develop and widely distribute "acceptable use policies" for Internet use, said Edward Cavazos, an attorney who represents Internet access providers for Andrews & Kurth LLP in Houston.

"And you can't just put up these policies and think you are shielded," Cavazos added. "You might be deemed negligent in not enforcing the policy."

Even worse, companies might be held accountable for the content of World-Wide Web sites to which their sites maintain hypertext links, some legal experts said. "The fact that you directed someone to another site may give the user the idea that you endorse the content at that site," said Peter Harter, executive director and general counsel at National Public Telecomputing Network in Cleveland.

COMPUTERWORLD ANALYSIS: CYBERLAW

Harter advised companies to carefully watch their Web site "guest books," where users may enter electronic comments so that complaints about content can be handled quickly.

The best approach may be to prevent on-line visitors from leaving material at your site, said Everett Patterson, a general partner at Seattle's Harvard Espresso Co., which unveiled its Web site two weeks ago.

"All material on Harvard Espresso's Web pages [has] been produced by the owners of the company," Patterson said. "We do not allow any other material, and we make no comments about other companies or individuals in our material. Nor will we ever do so."

His rule of thumb: "It is not good business practice to make any comments about another individual or company, either good or bad."

Balancing act

A Prodigy spokesman said last week the company will likely appeal the ruling. Prodigy wants to find a middle ground between assuming the mantle of publisher and having an "anything goes" approach to content, he added.

"We feel we should be able to offer an environment where one can't curse and use slurs," said Brian Ek, a spokesman for Prodigy in White Plains, N.Y. Prodigy has never checked posts for accuracy, he said.

In fact, Prodigy has been moving much closer to CompuServe's hands-off model in recent years. This week, for example, Prodigy will offer its subscribers the ability to create their own Web pages. "And we're not going to be screening those," Ek said.

The libel suit against Prodigy was filed by Stratton Oakmont, Inc., a Lake Success, N.Y., investment banking firm. In granting a motion for partial summary judgment last week, Judge Stuart Ain said Prodigy and a volunteer moderator should have removed an anonymous, libelous post against Stratton in Prodigy's Money Talk bulletin board.

Senior editor Mitch Betts contributed to this report.

Info leaks

Countries may try to erect information barriers to keep out "cultural pollution" and offensive messages, but those obstacles are easily surmounted by information technology.

"Governments inevitably try to fence information out, but the Internet can route the information around the fence," said Dan L. Burk, a cyberlaw expert at George Mason University School of Law in Arlington, Va.

In 1993, a Canadian judge ordered a news blackout on the sensationalistic details of the Karla Homolka murder case. Canadians eventually got the news, however, from U.S. media reports transmitted via fax and the Internet.

In an unusual twist, the U.S. is trying to keep its citizens from getting taxpayer-funded news reports on the Internet. The $1.4 billion U.S. Information Agency put its Voice of America news dispatches on the Internet last year, but it yanked many of them off the U.S. Internet site and put them on "secret" foreign sites. The move was made in compliance with a 1948 law that prohibits dissemination of government-controlled news broadcasts and propaganda inside the U.S.

—Mitch Betts

YOU DON'T BUY A DATA WAREHOUSE. YOU BUILD ONE.

Creating a data warehouse is like building a new home on unchartered territory... you don't know what you're getting into until you start digging the foundation. But you can greatly increase your chances for success by following a few basic rules.

RULE #1: HIRE AN EXPERIENCED ARCHITECT

Data warehousing is simply a new name for accessing, migrating, and staging data for optimum decision support applications...all the things Information Builders has been doing longer and better than any other software/consulting firm in the industry. Our experienced staff of professionals provide complete consulting, planning, implementation and training from more than 35 offices in North America.

RULE #2: LEARN BEFORE YOU DESIGN

Why attempt to restage and restructure data until you learn how it's going to be utilized by end users? Information Builders' EDA/SQL® middleware technology offers your users transparent access to virtually any database on any computer platform. Once they have access to the data, you can analyze how they use it and pinpoint any potential problems. And with our EDA/SQL SmartMode™ system, you can monitor all database activities so you can develop your most important resources first, design systems that make sense, and enjoy immediate benefits. Best of all, EDA/SQL can extend data access beyond your warehouse database, transforming your entire enterprise into a "Virtual Data Warehouse."

RULE #3: USE THE BEST TOOLS

Thousands of the world's leading corporations use Information Builders' FOCUS 4GL for data migration and staging on more than 35 computer platforms. Our EDA/SQL Copy Manager lets you replicate data from over 60 databases and EDA/SQL Catalog Manager makes managing meta data easier than ever before. Most importantly of all, our FOCUS Reporter for Windows and FOCUS SMP (Symmetric Multi-Processor) provide a level of performance for client/server reporting and decision support simply not available with today's relational tools.

RULE #4: START ASKING QUESTIONS AND YOU'LL START GETTING ANSWERS!

If a data warehouse strategy is in your future, contact your local Information Builders branch office or call us. We'll answer your questions, register you for our FREE Data Warehouse seminar, or set up an appointment for a consultation and evaluation. **1-800-969-INFO.** In Canada call 416-364-2760.

Information Builders

FOCUS and EDA/SQL are trademarks of Information Builders, Inc., NY, NY 212-736-4433 E-mail: info@ibi.com WWW: http://www.ibi.com
All other trademarks are the property of their respective owners.

© 1995 Lawson Software

Find out why Williams Field Services took the leap to Lawson
at http://www.lawson.com
or 1-800-477-1357.

IT'S LIKE INVESTING IN BUSINESS SOFTWARE. IF YOU'RE SMART YOU ONLY DO IT ONCE.

Your stomach is in your throat. Your heart is in your ears. One thing is certain. You don't want to have to purchase business software ever again.

That's why we designed Lawson Software to run on different client/server platforms. So wherever you go, we go.

It's why we're already up and running with object-based technology, while other companies race to figure out what it is.

And it's why we've loaded our applications with features like drill around™ and the latest GUI technologies. (We received the highest overall satisfaction ratings in *Computerworld's* Buyers' Satisfaction Scorecard on client/server financial software.)

We even offer an open licensing arrangement, which lets you migrate easily through technological changes and software upgrades without incurring additional licensing fees.

Lawson Software. For accounting, human resources, distribution and materials management applications. Because you don't really want to do this again, do you?

LAWSON Software™ THE LAST TIME YOU'LL CHANGE SOFTWARE COMPANIES.

Outsourcing taps on-line goldmine

By Ellis Booker

Outsourcing is flourishing on the Internet.

The Computer Museum in Boston recently kicked off its first charity auction in cyberspace with the help of Onsale, a Mountain View, Calif., company with a service for conducting real-time auctions and markdown sales via the Internet.

And in another corner of the on-line world, a start-up called netvideo recently launched an internet service for hosting and managing video for corporate customers. The Sunnyvale, Calif., company described itself as the first Video Service Provider for the Internet community.

As a well-known *New Yorker* cartoon notes: "On the Internet, nobody knows you're a dog." Nor, for that matter, do cyberspace customers know whether your firm's "server" is really sitting in the corporate data center or is maintained by a third party a thousand miles away.

The unimportance of geographic or organizational distinctions on the Internet is fertile grounds for many kinds of outsourcing, several experts said.

"All our research shows there's a distinction between running a server and running a site," said Richard Villars, director of network architectures research at International Data Corp. in Framingham, Mass. In addition to farming out vertical services, there are outsourcing opportunities for authoring and integrating content.

Another model — a more distant relative of outsourcing — is for companies to make their partners responsible for certain pieces of their World-Wide Web presences. "For example, you think you're looking at pictures of furniture at the retailer's site, but in fact, you've accessed the manufacturer's server," Villars said.

A different approach

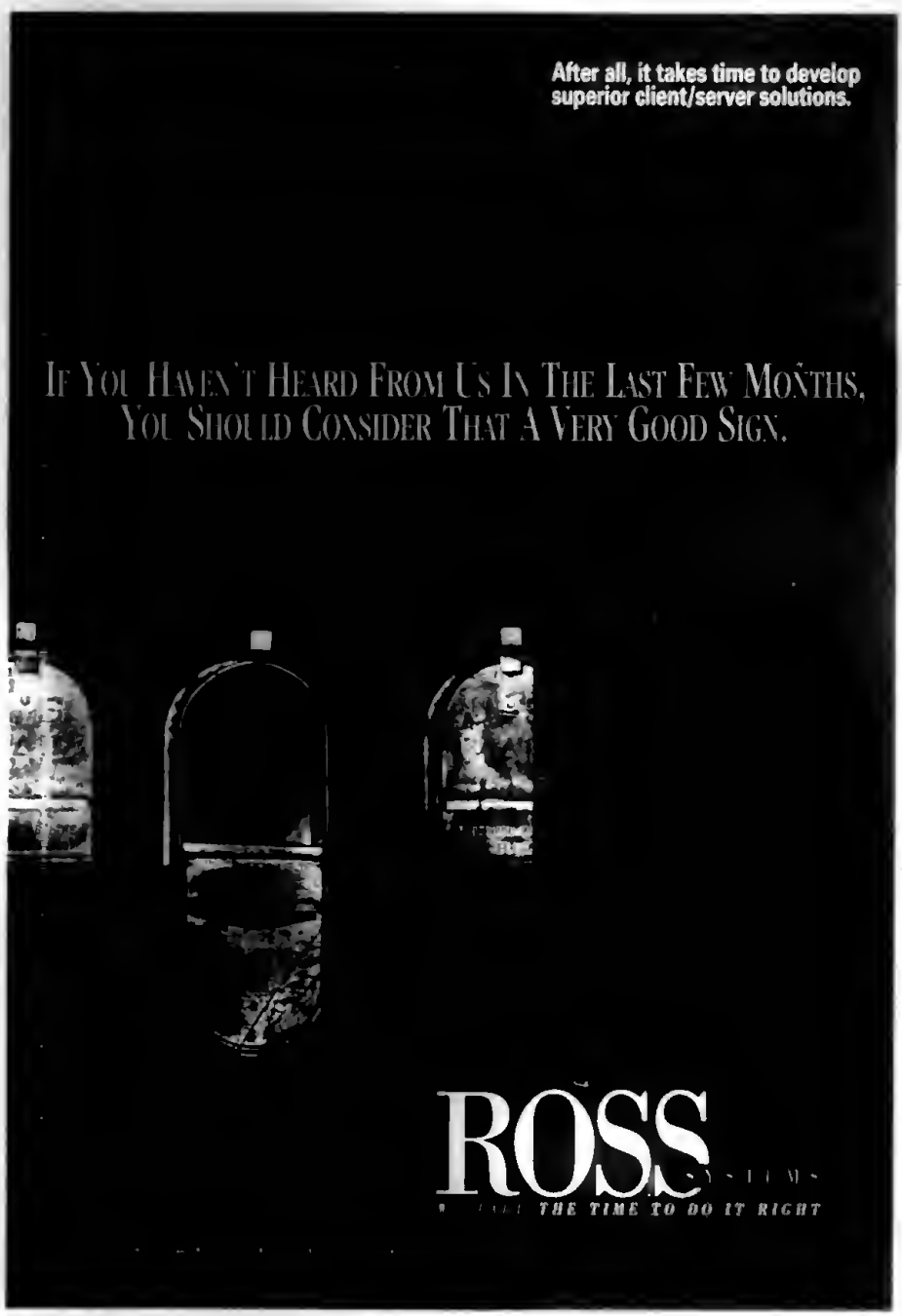
Stan Lepeak, a senior analyst at Meta Group, Inc. in Stamford, Conn., said traditional outsourcers such as IBM have done mostly soup-to-nuts work for clients getting on the Internet. But in the future, these firms may act more as compilers, pulling together several obscure companies whose services are spliced into the client's Web page. "This will be appealing from the standpoint of the client, who gets one point of contact," he said.

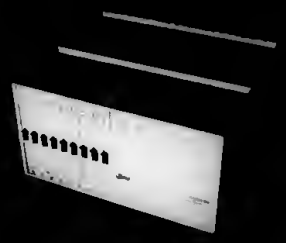
For example, the Computer Museum used a real-time bidding service from Onsale, which opened for general business last week, for its May 22-26 charity auction. Consumers "will turn to the service not only for shopping but as a source of entertainment," predicted Onsale Chief Executive Officer Jerry Kaplan. Onsale can be accessed at http://www.onsale.com.

Initially, Onsale will provide one of three interactive formats: standard auctions, Dutch auctions and markdowns. Bidding customers, but not casual browsers, must first register on-line with standard credit verification information.

Each auction page displays the highest bidder's initials, city and state. Customers can also request to be notified via electronic mail when their bids are no longer the highest. Security for the system is based on Netscape Communications Corp. secure servers and Web browsers.

At netvideo, the goal is to provide video transmission and compression from a central site and thus free up bandwidth at the corporate site for other applications, according to company president Hank Magnuski. His first customer is Novell, Inc., which is distributing CEO Bob Frankenberg's address from Comdex/Spring '95. This video can be accessed at http://corp.novell.com/whatnew/what new.htm.





Access the Globe.

Introducing
AT&T Paradyne's
DACS IAC integrated
access multiplexer.

We can only
think
of
one box
that
expands
more
than ours.

FREE

FREE

AT&T Paradyne

Information management isn't just processing 3 million voice messages every day.

Information management also helps Tom Welch confirm that the big deal went through.

Information management isn't just processing over 10 million emergency phone calls a year.

Information management also makes sure Carol Boyd's daughter gets the medical treatment she needs.

Information management isn't just processing 10 billion checks a year.

Information management also confirms that the Tremba Design check cleared today.

Information management isn't just processing millions of reservations for 140 of the world's airlines.

Information management also tracks every leg of Richard Wong's trip—even across several airlines.

© 1996 Unisys Corporation

Ordinary data processing vs. Unisys information management.

Sight vs. insight.

If you need to do data processing, there are a lot of companies out there ready to take your money. When they're done, you may even be able to process invoices faster. And that's important.

But if you wish that all the information you collect every day could make your company more competitive—and could be used to help serve customers better—there's only one real choice: Unisys.

We're the *information management* company. We help companies apply information technology and services to compete effectively and respond with agility to emerging customer needs. That's what we call **CUSTOMERIZE.**

To us, data processing is the beginning of the job, not the end. We're committed to understanding your business and your long-term goals, so we can help you manage information in totally new ways. Which gives you a powerful new strategic weapon.

Sure, we sell information technology and services. But our real business is turning information into management insights that will help you attract and retain customers. And the value of that should be easy for anyone to see.

For more information, or to receive your own "Guide To Information Management" facts kit, reach us on the Internet at http://www.unisys.com/adv or call 1-800-874-8647, ext. 221.

UNISYS

D&B Software customers dragged into code lawsuit

By Rosemary Cafasso

Six months after Dun & Bradstreet Software and Grace Consulting went public with their squabble over code modifications, the two companies are still locked in a legal dispute.

Now the lawsuit, in which D&B Software claims that Grace went too far in making changes to its mainframe software, is costing D&B Software friends in its customer base.

Three users contacted recently said D&B Software earlier this year subpoenaed documentation from them concerning their business dealings with Grace Consulting. Based in Upper Montclair, N.J., Grace provides consulting and maintenance services to 75 D&B Software mainframe customers. The firm has denied D&B Software's allegations.

Long term, the results of the code modification dispute could have disturbing consequences for D&B Software customers. Tweaking mainframe software code is a widespread practice, and if customers have strayed beyond the boundaries of their contracts with D&B Software, they could run into trouble. D&B Software in Atlanta issued a reminder to customers in late 1994, telling them to double-check their contracts to make sure their modifications were acceptable.

For the short term, some customers are peeved at D&B Software for pulling them into the Grace dispute.

"It has soured it," said Ken Leighton, director of information systems applications at Mitchell International in San Diego, when asked about his company's relationship with D&B Software. "We are still receiving requests from them to upgrade [the company's application software], and frankly we are thinking that there are other things out there that we should probably look at."

> D&B Software "indicated that they wouldn't cause us any grief, and it was just the opposite. They wanted printouts that would fill a room, 10 feet by 10 feet."
> — IS manager at a retail company

Leighton said D&B Software subpoenaed documentation from his company that took three people on his staff a day each to track down and produce. D&B Software requested "all the mods we made to the system, and I've made a lot of mods to the code. It required a lot of work," Leighton said.

Going to court

No users have been named as defendants in the lawsuit. But between 15 and 25 Grace customers have been subpoenaed to supply documentation, said James Alberg, a D&B Software senior vice president and general counsel.

He noted that document requests are routine in a lawsuit. He also said the company has worked with customers to "narrow the scope" of the documentation they must provide.

"They indicated that they wouldn't cause us any grief, and it was just the opposite," said one IS manager at a retail company who requested anonymity.

"They wanted printouts that would fill a room, 10 feet by 10 feet," the IS manager said. After lawyers from both sides met, it was finally decided that the retail company could provide D&B Software with code on magnetic tape and "a handful of documents."

Earlier this year, D&B Software stressed it was trying to keep customers out of the lawsuit with Grace. Last week, Alberg said that continues to be the company's position, but certain documentation was required for the lawsuit.

Users such as Bob Malloy, manager of systems development at the Bowman Gray School of Medicine at Wake Forrest University in Winston-Salem, N.C., say they consider it a big inconvenience.

"I can't even estimate the cost," Malloy said. "Just the time involved for me and the staff, it was a lot of hours."

Finally, A UPS That Has It All...Reliability, Immediate Payback, And Worldwide Support.

The Only UPS With A Cell Saver™ Interface For Longer Battery Life.

The Only UPS That Controls Power Across Novell And Unix Platforms.

UNINTERRUPTIBLE POWER®
Powerware®

The Only UPS That Can Be Turned On And Off With Network Power Management Software.

On-line UPS With Reliability Backed By ISO-9001 Quality Certification.

The Only UPS Available In Single And Three-Phase Output From 250 VA-375 kVA.

You Can Have It All:

- *On-Line Technology – Better Than Line-Interactive*
- *AS/400, LAN, Serial Interfaces Built In – Front Panel Selectable*
- *X-Windows GUI – Easier To Use*
- *Network-Ready SNMP Communications*

Call for the facts and a free videotape
1-800-554-3448 x581

EXIDE ELECTRONICS
Helping You Stay In Power®

8521 Six Forks Road, Raleigh, NC 27615 • 919-872-3020 • 800-75-EXIDE Fax• International: 919-870-3150 • 919-870-3300 Fax

Now that you've found UnixWare 2, find out more.

Send for your free cyber optic poster and your free kit on integrating UNIX in a NetWare environment.

1 What is your role in the purchasing decision? (Check one)
A ☐ Recommend B ☐ Specify C ☐ Approve D ☐ Purchase E ☐ Use

2 When do you plan to purchase? (Check one)
A ☐ Within 3 months B ☐ Within 6 months C ☐ Within the next year D ☐ Information only

3 Would you like a Novell Consulting Partner to help you assess your needs?
A ☐ Yes

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone ( ) _____ Fax ( ) _____

E-mail address _____

NOVELL

Please drop this card in the mail, fax it to us at (512) 218-3828, or call us at (800) 789-1037.

CW6-5

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 7971 AUSTIN TX

POSTAGE WILL BE PAID BY ADDRESSEE

NOVELL UNIXWARE
PO BOX 202558
AUSTIN TX 78720-9889

INTRODUCING THE FIRST UNIX APPLICATION SERVER DESIGNED TO BRING BUSINESS-CRITICAL COMPUTING TO YOUR NOVELL NETWORK.

UnixWare 2 blends the proven power and [illegible] reliability of UNIX into your existing NetWare network. Based on the very latest version of powerful UNIX System V technology, it delivers exceptional 32-bit performance with features like built-in symmetrical multiprocessing for flexibility to grow right along with your business. And NetWare-ready UnixWare 2 plugs right into your current network environment, letting you transparently share files, printers, e-mail and more. Plus, easy graphical administration and quick, painless installation let you save time and money. And most importantly, UnixWare 2

UNIX NetWare

supports [illegible] existing business-critical applications and [illegible] the market-leading databases. UnixWare 2 [illegible] to own. Running on industry-standard Intel-based hardware, it delivers exceptional value and effortless scalability, from single-processor systems to large multiprocessor servers. Find out just how easy it is to take advantage of the power of UnixWare 2. Call 1-800-789-1037 and we'll send you a free NetWare UNIX Integration Kit, plus a UnixWare 2 [illegible] poster just for calling.

UnixWare2

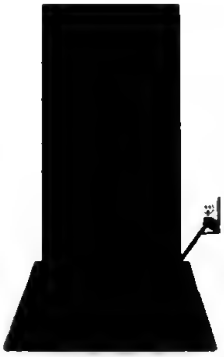
CALL 1-800-789-1037

NOVELL

An AS/400 Advanced Series Solution

Behind Gary Whiting's success in speeding the response time of Great Western's network

is knowing whose system is jamming up



He was the first to see that AS/400 Advanced System could be purchased for less than the depreciation expense of his old computers.

and a timely assist from some new AS/400 Advanced Systems.

For MIS Director Gary Whiting, the perfect network is built around two numbers: a high one for network satisfaction and a low one for network cost.

Both were challenged. Rapid growth of his consumer finance network was taking response time to unacceptable levels. Administrative costs were rising.

His solution: upgrading to AS/400 Advanced System, using AS/400 as the backbone of his distributed processing configuration.

The result? Response time and transaction time on the network improved from five seconds to under a second. Support costs fell.

And with AS/400 Advanced Series financing, Whiting could configure his system for less than the depreciation cost of his old computers.

Interested?

To see how others are using AS/400 Advanced Series at 99.7 percent reliability, call 1 800 IBM-3333, ext. BA135. Or, if on the Internet, stop by our Home Page at http://as400.rochester.ibm.com

IBM

Solutions for a small planet™

IBM and AS/400 are registered trademarks and Solutions for a small planet is a trademark of International Business Machines Corporation. © 1996 IBM Corporation.

Analysts agree, our new Symmetrix 5100 comes with something IBM's RAMAC can't offer.

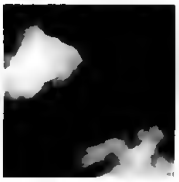
A real future.

To be brutally honest, we don't understand why any organization would invest time, energy and money in a storage system with a limited future.

A storage system whose controller capacity has been capped and deemed by analysts to be "at, or near, the end of its life." A system the experts have labeled a "pea shooter" compared to EMC's "howitzer."

RAMAC

The weapon we're referring to is Symmetrix® 5100, which has the capacity to let you start at 34 gigabytes and get as big as your future will allow – all thanks to our unique modular architectural approach, MOSAIC:2000®. Plus, the 5100 gives you higher performance, lower cost of ownership and our exclusive Symmetrix Remote Data Facility.



5100

RAMAC's future is fading. Learn why, with Symmetrix 5100, your future is brighter than ever. Call 1-800-424-EMC2, ext. 217, for a free interactive information kit.

PERFORMANCE IS MAXIMIZED BY A FACTOR OF EMC²

THE STORAGE ARCHITECTS

EMC², Symmetrix, MOSAIC 2000 and THE STORAGE ARCHITECTS are registered trademarks of EMC Corporation. All other trademarks are the property of their respective owners. ©1995 EMC Corporation. All rights reserved.

Take a slice off the price of COMPUTERWORLD.

51 issues for only ~~$48~~. *Now Only $39.95*

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - o savings of $8.00 off the basic subscription price.

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./Retailer
95. Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin. Services
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
60. Sys. Integrators/VARs/Consulting Management

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Manager
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Management

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

E4F5-8

Take a slice off the price of COMPUTERWORLD.

51 issues for only ~~$48~~. *Now Only $39.95*

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - o savings of $8.00 off the basic subscription price.

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./Retailer
95. Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin. Services
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
60. Sys. Integrators/VARs/Consulting Management

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Manager
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Management

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

E4F5-8

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-4144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-4144

Microsoft accused of MAPI secrets

Novell, Lotus cite foul play; messaging interface specifications not revealed

By Suruchi Mohan

A battle of the titans is brewing on the messaging standards front, with Novell, Inc. and Lotus Development Corp. both accusing Microsoft Corp. of playing its MAPI cards a little too close to the vest.

MAPI, or Messaging Application Programming Interface, is a set of specifications that developers need to write applications in the Windows environment that are independent of the messaging transport.

Lotus and Novell are accusing Microsoft of not being completely candid about publishing the specs for MAPI 1.0, which will be released with Windows 95 later this year.

Microsoft denies any foul play, but the developers insist that Microsoft is deliberately hiding some extensions to enhance its competitive advantage.

If the issue is not resolved, "what will happen is that Novell, Lotus and Microsoft will do it their own way," said Stewart Nelson, acting general manager of the groupware division at Novell in Orem, Utah. Novell claims that Microsoft has not published the specs for shared folders and rules.

Larry Jones, group product manager at Lotus in Mountain View, Calif., agreed with Nelson, adding that Microsoft has not published the application programming interfaces (API) for calendaring/scheduling either.

They can't relate

Small developers said they have not experienced the problems Novell and Lotus describe. "We have the entire spec we need at this time," said David Skok, president and chief executive officer of Watermark Software, Inc. in Burlington, Mass.

"Given [that] they have not published [the APIs], we're going to have to define our own extensions. This will close off customer choices in terms of how much mix and match [of clients and servers] they can expect," he explained.

Perhaps more than any other big developers, Lotus and Novell feel cheated because they abandoned their competing Vendor-Independent Messaging (VIM) effort and went with MAPI because of the large installed base of Windows.

Greg Lobdell, group product manager at Microsoft's business systems marketing division in Redmond, Wash., said, "Every bit of communication between the Exchange client and server is done with documented APIs; there are no undocumented APIs."

He said all the extensions do is allow a back-end service provider such as Microsoft's Exchange or Notes to "expose behavior" to the client. This means that any service provider can add functions that can be used by the client, such as rules and shared folders. Lobdell said these are properties or specific functions of a product and do not necessarily have a place in the API specification.

But competitors do not buy this argument. Unless Microsoft tells developers how clients can use those properties, they are essentially proprietary and give Microsoft a competitive advantage, said Eugene Lee, a director at Banyan Systems, Inc. in Burlington, Mass.

However, Lobdell said all companies are welcome to get the competitive edge by adding their own functions. "We are not in the market of creating commodity products where no one can distinguish themselves," he said.

Marion Weiler, an electronic-mail technologist at Chevron Information Technology Corp. in San Ramon, Calif., said he is less concerned about vendor wrangling than he is about his installed base.

"If they do have unpublished specs, Exchange would be able to offer feature and function sets before anybody else," Weiler noted. "We're not in a single vendor/single product environment, and if they limit the value of our investment, we will work to turn that around."

Change of plans

Microsoft recently said it will not support MAPI on the Macintosh platform. The software giant has already abandoned MAPI support for OS/2 and Unix.

This latest action marks a significant departure from Microsoft's earlier position that it would make MAPI a cross-platform development API, said Eric Hahn, president of Collabra Software, Inc. in Mountain View, Calif. Microsoft has historically supported the Macintosh.

Dropping MAPI support for the Macintosh also means that users will not be able to take advantage of the collaborative [illegible] available to Windows users. "Microsoft is forcing the Mac to be a second-class citizen in the groupware situation," Hahn said.

Last week, Microsoft responded that it would recommend the Common Messaging Call (CMC) — a vendor-independent messaging API — for the Macintosh, although a spokesman acknowledged that CMC is not as powerful as MAPI.

—Suruchi Mohan

USF&G decides database plans; Insurer selects Sybase, not Microsoft

By Kim S. Nash

USF&G Corp. recently made a surprising database decision. Although the $14 billion insurer's client/server dream counts heavily on Microsoft Corp.'s Windows NT operating system, USF&G bypassed Microsoft's database to standardize on Sybase, Inc.'s product instead.

Crucial to USF&G's client/server vision is keeping the company untethered from specific vendors, according to Tom Lewis, chief information officer at the Baltimore-based company. If Windows NT falls apart, for example, USF&G will go with Unix, he said.

"None of this is religion to us," Lewis said.

Anti-establishment

USF&G opted for Sybase's System 10 database to run on its Windows NT platforms rather than Microsoft's SQL Server database for several reasons:

Sybase System 10

Proven, more mature database; offers Replication Server for copying and distributing data

Microsoft SQL Server 6.0

Little experience with enterprisewide distributed databases; tied to a single operating system — Windows NT

Re-engineering

Likewise, USF&G has avoided Sybase's PowerBuilder development kit in favor of object-oriented tools from other vendors.

Yet the notion did cross USF&G's mind that going with Sybase's System 10 database instead of Microsoft's SQL Server could lead to compatibility problems. Microsoft has pledged to increasingly tie together SQL Server and NT, positioning the two as peas in a pod.

USF&G examined technical support carefully. Microsoft and Sybase, once joint developers of the SQL Server database, dissolved much of that partnership a year ago.

So before Lewis signed a multimillion-dollar license with Sybase, he said he talked extensively with both Bill Gates, Microsoft's chief executive officer, and Mark Hoffman, Sybase's CEO, to be sure the vendors would cooperate with each other in case of technical problems. "It's in Microsoft's interest that people succeed using Sybase, or any other database, on NT," he said.

USF&G's client/server setup sandwiches Compaq Computer Corp. PC servers running Windows NT and Sybase's System 10 database between AT&T Global Information Solutions Unix boxes — also with Sybase — on the high end and Windows desktops and laptops on the low end.

USF&G's Tom Lewis grilled Microsoft's Bill Gates and Sybase's Mark Hoffman to make sure the vendors would cooperate.

USF&G's Ron Shelby negotiated "most-favored" pricing from Sybase on services and consulting.

USF&G expects to roll out a new Sybase-anchored application next quarter, giving mobile insurance agents dial-up access to corporate databases on NT and Unix, said Ron Shelby, assistant vice president of USF&G's information management division.

> USF&G has agreed to buy, at an unspecified discount, $2.3 million worth of Sybase software this year and next and has signed "a healthy agreement for consulting," CIO Tom Lewis said

As much as Microsoft may want to become a contender in the enterprise-level database market, the company must be realistic, said Cary Prague, president of Cary Prague Books and Software, a Windsor, Conn.-based independent consultant who works with insurance and other companies.

Microsoft SQL Server is clearly for workgroups, Prague said. Though Windows NT "is an outstanding network platform," he said, "a company that wants to get serious about bringing data down [from mainframes] should not go with Microsoft [SQL Server]."

To address these issues, Microsoft plans to ship SQL Server 6.0 in August with new features such as multiprocessor support and replication capabilities designed to enable remote databases to keep in sync with central ones.

NT servers are still catching up to other boxes. See page 45.

They

it all. They

Microsoft Windows NT Workstation gives your high-end users the powerful operating features they want. NOW.

want it now.

Chances are, your high-end users have been screaming for an operating system that can keep up with their demands. You, on the other hand, want a system that's secure, reliable and compatible with the networks, hardware and applications you already have.

Microsoft® Windows NT™ Workstation may be the answer. It's the high-end complement to the Microsoft Windows® 95 operating system. It can handle the most demanding business needs. From financial analysis and engineering to manufacturing and corporate development.

Windows NT Workstation can make your job easier. Built-in security helps prevent user-error, tampering and unauthorized access. Proven reliability means less downtime and fewer service calls. Remote management allows you to gather information and administer the system from your desktop. And because it supports Windows NT Server, Novell® NetWare® and UNIX® networks, it's network-ready right out of the box.

Your users will get what they want. They can run and integrate both 16-and 32-bit business and productivity applications, including the new wave of applications built for Windows 95. Users can run two or more applications at the same time with full pre-emptive multitasking. There's full crash protection so even if one application fails, the others continue to run. And through better use of system resources, users won't be bothered with "out of memory" messages. It just works. Giving your users exactly what they want.

To get all the details, call (800)583-0034, Dept. YWD, or visit the BackOffice section of our website at http://www.microsoft.com.

Microsoft®

WHERE DO YOU WANT TO GO TODAY?™

Windows NT Workstation can run on a 12 MB 486DX, uses most MS-DOS® and 16-bit applications, and is compatible with most hardware and peripheral configurations. For information only. In Canada, call (800) 563 9048. © 1995 Microsoft Corporation. All rights reserved. Microsoft, MS-DOS and Windows are registered trademarks of Microsoft Corporation. *Where do you want to go today?* and Windows NT are trademarks of Microsoft Corporation. NetWare and Novell are registered trademarks of Novell, Inc. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company, Ltd.

Briefs

Wang stake sold

The deal between Wang Laboratories, Inc. and Microsoft Corp. has been completed, with Microsoft purchasing $90 million of convertible preferred Wang stock. This amounts to a 10% stake in the Lowell, Mass., company. The agreement, which was announced April 12, settles Wang's patent infringement suit against Microsoft.

Frame buys firm

Frame Technology Corp. in San Jose, Calif., has agreed to acquire Mastersoft, Inc., a Scottsdale, Ariz., maker of conversion, viewing and document comparison software. The purchase will help Frame, a maker of document creation, management and distribution software, with its strategy to let data contained in various formats be placed in document repositories for reuse.

Fore buying spree

Fore Systems, Inc. attempted to bolster its position in the switching market with the purchase of Applied Network Technology, Inc. in Westford, Mass., for $35 million. Pittsburgh-based Fore also acquired RainbowBridge Communications, Inc. in Washington, a maker of Asynchronous Transfer Mode software.

SHORT TAKES Retrieval software company Fulcrum Technologies, Inc. in Ottawa has agreed to acquire French systems integrator Fulmedia S.A. for $1.5 million. . . . Springfield, Mo.-based Applied Cellular Technology, Inc. has agreed to acquire Baler Software Corp. in Rolling Meadows, Ill. . . . San Diego-based multimedia software maker Allegiant Technologies has completed its initial public offering on the Vancouver Stock Exchange. . . . Micro Focus, Inc. in Palo Alto, Calif., has completed its acquisition of Burl Software Laboratories, Inc. in Raleigh, N.C.

McAfee to buy Saber Software

Firm strives to be No. 1 in PC administration suites

By Steve Moore

McAfee Associates, Inc last week announced plans to buy Dallas-based Saber Software Corp. for $40.6 million. Santa Clara, Calif.-based McAfee is making a bid to become the leading provider of integrated PC administration suites, a key segment of the fast-changing client/server management market.

McAfee also seeks to broaden its customer base and gain Saber's sales channels.

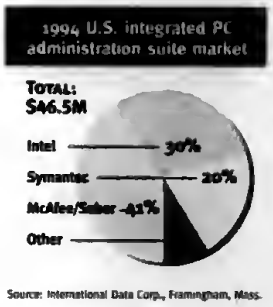
According to International Data Corp. in Framingham, Mass., McAfee and Saber together hold 41% of the market for software suites that bundle PC LAN management functions such as software distribution, software license metering and hardware and software inventories (see chart).

Analysts said users will benefit in the long run as the companies begin to integrate their product sets, including nonoverlapping pieces such as McAfee's antivirus applications and Saber's NetWare LAN management applications.

Next year, users will see the companies "merge best-of-breed products into combined products," said Bill Larson, McAfee's president and chief executive officer.

McAfee will "deliver on all commitments to McAfee and Saber customers" and will help them through the transition to Microsoft Corp.'s long-awaited Windows 95 operating system by ensuring "no changes in product road maps is the next six months," Larson added.

Users expressed confidence that the products would work well together. "The biggest thing is to try to standardize everything across your network so [that] it's easier to manage," said Randy Manske, a senior LAN administrator at Oppenheimer Management Corp. in Denver. "Both [the McAfee and Saber] tools seem to do a pretty good job of that, and they will probably integrate everything."



Source: International Data Corp., Framingham, Mass.

Because McAfee's purchase of Saber will "double our sales force and engineering staff overnight, we probably won't have to hire for a while. But I don't see the need for a reduction in research and development, sales or technical support" staffs, Larson said.

While some Saber product names will likely be retained, the merged firm will operate under the McAfee name, Larson said.

Red Brick runs into warehousing competition

Oracle, Sybase plan rival products

By Kim S. Nash

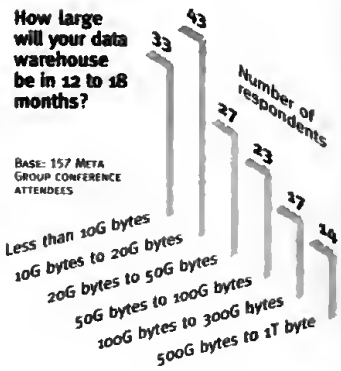
Red Brick Systems better have its data warehouse in order.

The privately held, Los Gatos, Calif., firm said it has made a nice living for the past nine years. It is a leader among firms selling databases designed specifically for data warehousing to users looking to build complicated decision-support and marketing applications. General Mills, Inc., Longs Drug Stores Corp. and Sara Lee Corp. are among Red Brick's 70 customers.

But today, Red Brick faces a pack of competitors salivating after its market. Sybase, Inc., Informix Software, Inc., IBM and a bevy of other traditional database companies have recently announced marketing and product plans designed to gain ground in the data warehousing arena.

Claiming these competitors are just retrofitting transaction-oriented databases into warehouses, Red Brick said it offers users warehouses built from the ground up.

Even so, some observers do not give Red Brick favorable odds for survival. With 100 employees — including just 16 salespeople — the company is small. Furthermore, the technical differentiators that have propelled it from a four- to 70-member installed base in 18 months may get lost in the huff and puff of a relational onslaught, said Frank McGuff, a consultant at Braun Technology Group in Chicago.



Source: Meta Group, Inc., Burlingame, Calif

For example, though relational database market leader Oracle Corp. has yet to enumerate any coherent warehousing strategy, the company is expected to be a big warehouse contender.

"Oracle's the big man on campus. That alone will convince some customers to buy, regardless of what Oracle eventually comes out with," McGuff said.

According to Chris Erickson, Red Brick's president and chief executive officer, sales tripled last year compared with 1993, and the company is "well ahead" of its goal to double sales this year. The average customer deal is $150,000, including software and services, said A. J. Brown, vice president of marketing.

Yet Erickson acknowledged that at least some user hearts cannot be won because some shops routinely standardize on one vendor for all database needs.

"But that's often a mistake," he said. Transaction processing applications are too different from warehousing systems to be run on the same database, he said.

For example, Healthsource, Inc. in Hooksett, N.H., opted to split warehousing from transaction processing databases last year. "Cramming warehouse stuff onto the same system running production applications just means that you do neither very well," said Brian Harney, the company's database administrator.

Defensive moves

To further decrease the cost of investment, and therefore the risk of going with a smaller vendor, Red Brick plans to launch a workgroup warehouse product line in July, Erickson said.

Instead of giant warehouses of several hundred gigabytes of data, some users want smaller "data marts" spawned from primary warehouses. These marts are often specific to a single department and are easier to manage than their larger parent warehouses (see chart).

On the sales front, Red Brick plans to add two more salespeople this year, Brown said. But the company counts more on resellers, he added.

Oracle to ship warehousing database. See page 77.

THE VIEW FROM THE TOP

An exclusive CEO/CFO survey
on IT in Computerworld's June 12 issue

This exclusive survey of major U.S. companies asks CEOs and CFOs their views on:

IT STRATEGY

- *Does IT hold the key to competitive advantage?*
- *Is IT strategy effectively linked with business strategy?*
- *Do investments in IT pay off?*
- *Do IT projects come in on time and on budget?*

IT MANAGEMENT

- *How satisfied are CEOs with the overall performance of their IS organization?*
- *How do CEOs rate the chief information officer's performance?*
- *What skills are important in the CIO function?*
- *How is the IS function organized – centralized, decentralized or a mix?*

IT IN THE EXECUTIVE SUITE

- *What percentage of time do they devote to IT decisions and issues?*
- *How do they get their information on IT?*
- *Do they use a PC/executive information system?*

COMPUTERWORLD

THE NEWSPAPER OF INFORMATION SYSTEMS MANAGEMENT

COMPUTERWORLD
The 100,
CEO/CFO
survey

Finance in Phoenix maxed out their mainframe.

Operations in Oslo is screaming for NT.

Marketing in Muncie wants database miracles.

When do we start?

Teradata is a registered trademark of AT&T Global Information Solutions.
All other products are registered trademarks of their respective companies.
© 1995 AT&T Global Information Solutions.

Let's say operations needs to reduce the amount of time they spend doing standard reports, so they can concentrate on ad hoc end-user requests.

Or manufacturing needs a more flexible computing environment to let them optimize resources across multiple facilities worldwide.

From time to time, every company has holes their strategic computing partner just can't fill.

As one of the world's largest computing and communications companies, we'd like to show you our resources, and how we can help.

Full range of global services.

For starters, we bring you one of the leading IT service organizations. With over 19,000 people in 1,100 offices in 130 countries, we can help with anything from business consulting in Singapore to NT support in Nutley, New Jersey. In fact, Microsoft® selected our services organization to support Windows NT worldwide.

Need help designing and integrating databases? How about migrating critical applications to distributed environments? They're just two of our core competencies.

World leader in decision support.

We can also help you make the most of new technologies other computer companies are still learning about. For instance, we supply 80% of the world's commercial massively parallel processing systems, and are also a leader in symmetric multiprocessing.

Thanks to powerful alliances with Oracle,® Sybase,® and Informix,® and 13 years of experience with our own Teradata® database, we can help you design, implement and maintain decision support solutions that turn terabytes of summary transactional data into detailed, actionable information.

UNIX,® Windows NT,® NetWare® or OS/2.®

We're also a price/performance leader in general purpose computing. With a full line of open, scalable Intel®-based servers that can run any major operating system. To give you flexibility anywhere in your enterprise.

Learn more about us. Call 1 800 447-1124, extension 1040.

And tell us when we start.

GET move USE IT.

Bringing computing and communications together to help you get, move, and use information.

AT&T
Global Information Solutions

Who's the boss?

Whether or not it is true, the story of the million-dollar mug is one of my favorites. It's as relevant today as it was several years ago when it allegedly took place.

As the story goes, an IS director met with his IBM rep to consummate a very major mainframe deal. The buyer knew he was going with IBM and had read IBM's contract the night before.

As they sat in the buyer's office, a secretary popped in with the buyer's morning coffee in a forest green mug with "Amdahl" printed in gold on the side facing the sales rep. One look at the mug and the rep had dropped the contract price by a million dollars by the end of the negotiations.

Moral of the story: Back then and even more so now, the customer is king, and probably to a far greater extent than he realizes. This is an important point to ponder when assessing the news of the day.

For example, some customers have expressed a mounting concern over the growing "power" of companies such as Microsoft and Computer Associates. Together these companies will account for less than $4 billion in U.S. sales this year. By contrast, you, the customer, will purchase some $90 billion worth of software.

Further, for virtually every product these two companies sell, there is not only an alternative vendor's product available, but in some cases an alternative technology. So if CA unwisely decided to escalate prices in the discrete mainframe markets it dominates, then there would be no time like the present to inform it of your long-term plans to migrate away from the mainframe. In fact, the threat of mainframe alternatives is what got CA and other companies to institute more buyer-friendly software licensing schemes in the first place.

There is also the concern that companies that become big forget about the things that helped them grow, such as customer support. Let me tell you, a vendor's worst nightmare is picking up a copy of any trade paper and reading about the poor job its customers say it is doing with support. So if your vendor is unresponsive to complaints, just drop a dime. There's a list of phone numbers on the opposite page.

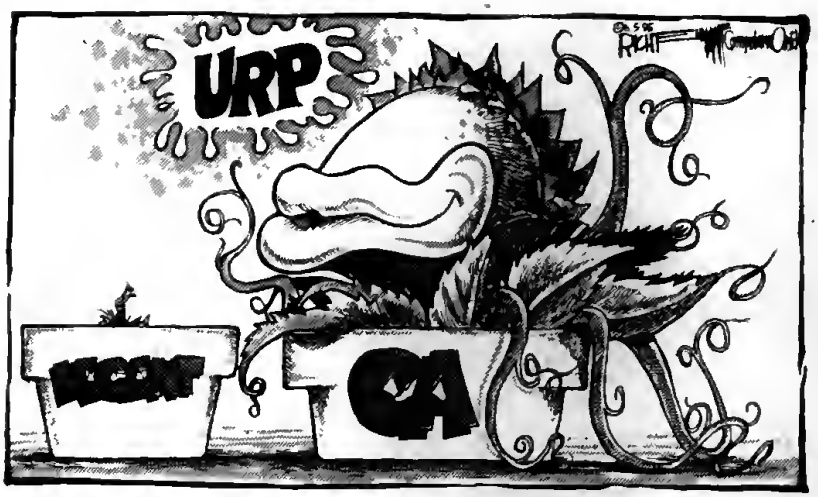
Take heart, too, in the ways in which such big vendors have conducted business in the past. By effectively killing Microsoft's purchase of Intuit, the government argued that Microsoft would raise prices when and if it came to dominate the personal finance market. In fact, it has steadily lowered prices of most of its products even as its market share grew.

And every time CA made a major acquisition, be it Cullinet, Pansophic or Applied Data Research, there was fear and consternation from customers of the acquired company. Understand, however, that CA's entire business model depends on maintaining those customers and migrating them to other products. To that end, CA has been very successful. By this point, it knows how to make an acquisition as well as or better than any other company.

Remember, there's always the mug.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: *blaberis@cw.com*



'Trash' talk

I found "Retrain, don't trash" [CW, May 22] quite refreshing. It's sad that information technology managers are so eager to secure client/server talent that they ignore the older, more experienced mainframe crowd, whose members often possess a tremendous amount of systems and business savvy. It has also been my experience that it works to put the two groups together in an environment that enables knowledge transfer, but only when real projects are handed out with real deadlines and with team members from both groups using the new technologies.

To a motivated mainframer, client/server is really just another technology, and many are dying to make the switch. If information technology managers would be more willing to support these people on new client/server projects, I wouldn't be surprised if most of our desperate client/server talent searches would disappear.

Dave Wright
Virginia Beach, Va.
david.wright@cbn.org

Your comments regarding retraining represent what I have believed for years, but I could not get anyone to listen to me. Thank you for so clearly stating what I believe is so obvious, that retraining is the best way to advance a person's skills.

Stephen R. Page
Vadnais Heights, Minn.
76452.1514@compuserve.com

Praise be that someone has realized that we old legacy types still have some value in this business. Cutting loose a Cobol programmer with 20 years' experience is throwing away 20 years of expertise in the business. If that's not throwing out the baby with the bathwater, I don't know what is.

I have been in this business since 1969. I've learned a lot of languages over the years, including Visual Basic. The fundamentals of good system design and data flow are as important now as they ever were, and that's what an experienced corps of veterans can bring to a project.

Eric Helland
Milwaukee
UWRL30A@prodigy.com

Money talks

Charles Babcock's "Needed: a new client/server metric" [CW, May 1] raises a good point but fails to address the underlying problem, which is common to mainframe and client/server applications.

Any business sees its IS investment, whether for punch cards, mainframes or PCs, in terms of return on expenditure. The company style of management, the IS department's approach and the "buy-in" of the end user are the determining factors, irrespective of the technology choice. The high expectations driving the client/server market will wane and be replaced, hopefully, with a more balanced look at "What tool will help this corporation meet its goals?"

Patrick J. O'Meara
Cupertino, Calif.
73261.275@compuserve.com

Training budgets need redirection

Michael Schrage's "Training for MIS failure" [CW, May 8] is right on in almost every way, especially in pointing out the essential characteristics of adult learning for practical (i.e., work-related) purposes. However, I think he is wrong to recommend that "cutting the training budget ... would be a healthy start." Effective mimetic education will still take time and cost money for the following kinds of activities:

- Identify and foster learning skills in coaches, apprentices and team members.
- Plan, evaluate and continually improve the learning experience.
- Reward coaches, apprentices and teams for increasing the "intellectual capital" of the organization.
- Create and maintain the infrastructure to capture and access that intellectual capital.

These are much better investments than removing employees from their workplace, renting countless hotel rooms and producing dust-accumulating course manuals.

Mary Callahan
Roswell, Ga.

More letters, *page 39*

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Editor
Paul Gillin
News Editor
Marylan Johnson
Technology Evaluations Editor
James Connolly
Sections Editor
Johanna Ambrose
Assistant News Editor
Patricia Keefe
Technical Editor
Charles Babcock
Senior Editors
Craig Stedman, Large Systems
Michael Fitzgerald
Internetworking
Rosemary Cafasso
Client/Server Software
Laura DiDio, Networking
Elizabeth Heichler
Application Development
Mid-Atlantic Bureau
Thomas Hoffman, User Strategies
(201) 587 0090
Julia King, Management
(215) 537 2599
Washington, D.C., Bureau
Mitch Betts, Social & Legal Issues
(202) 347-6718
Gary H. Anthes, Government & Security
(202) 347 0134
West Coast Bureau
Jean S. Bozman, Open Systems
Kim S. Nash, Databases
Steve Moore, Storage Management
Lisa Picarille, PC Software
(415) 347-0555
Midwest Bureau
Ellis Booker, Electronic Commerce
(708) 827 4433
Pacific Northwest Bureau
Stuart J. Johnston, PC Operating Systems
(206) 641 7776
Southwest Bureau
Patrick Dryden, Network Management
(817) 924-5485
Senior Writers
Jaikumar Vijayan, Neal Weinberg,
Mindy Blodgett, Michael Goldberg
West Coast Bureau
Suruchi Mohan
(415) 347 0555
Staff Writer
Tim Ouellette
New Products Writer
Stewart Deck
Design Liaison
Stefanie McLann
Features Department
Senior Editors
Michael L. Sullivan-Trainor, CW Guide
Joseph Maglitta, Corporate Strategies
Lory Cottola Do, In Depth
Allan E. Alter, Management
Kathleen Gow, In Depth
Associate Editors
Jodie Haze, Careers and Marketplace
David B. Weldon, Management
Cathleen Gagne, CW Guide
Senior Researcher
Kevin Burden, Filing Line/Scorecard
Special Projects Editor
Bruce Rayner
Managing Editor, Special Projects
Joyce Chutchian Ferranti
Senior Research Manager
Bob Fink
Research Analyst
Laura Hunt
Flagstaff Intern
Amy Malloy
Chief Copy Editor
Anne McCrory
Assistant Chief Copy Editor
Christina Aicardi Maguire
Senior Copy Editors
Kimberlee A. Smith, Jill Zolot
Ellen Fanning, Michelle I. Keyo
Copy Editors
Kimberly Gilliand
Jay F. Burell, Michelle Grabon
Roberta A. Fusaro
Design Director
Tom Monahan
Senior Graphic Designers
Nancy Kowal, Mitchell J. Hayes
Graphic Designers
Janell Genovese, Mary Beth Welch,
David Waugh
Cartoonist
Rich Tennant
Office Manager
Linda Gorgone
Editorial Assistants
Lorraine Witzell, Connie Brown
Aleksandra Skulte
West Coast Bureau: Chris Flanagan
Computerworld Client/Server Journal
Alan Alper Editor
Catherine McCrory, Managing Editor
Mary Brandel, Senior Editor
Stephanie Faucher, Graphic Designer
Electronic Marketplace Liaison
Lisa Davidson
Rights and Permissions Manager
Sharon Bryant
Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
(508) 879-0700; TDD (800) 428-0244
MCI Mail, 275-6273
CompuServe 76537,2413

Don't forget incentives in groupware strategy

Michael Schrage

Watching IS organizations attempting to implement enterprisewide groupware brings to mind Dr. Johnson's 18th-century epigram about dancing dogs and women preachers: It's not that it's done well, it's that it's done at all.

Most Notes, GroupWise and Share rollouts seem inspired by a more contemporary but equally troublesome cliche: If you build it, they will come.

Guess what? They won't.

What many companies are discovering — at great expense — is that all this groupware that's supposed to promote such mom-and-apple-pie values as collaboration, knowledge sharing and teamwork is fundamentally irrelevant to how most people do their jobs. Paradoxically, the better the technical implementation of groupware, the more counterproductive and problematic its organizational impact can be.

Giving someone collaborative tools doesn't make him collaborative any more than handing someone a telephone turns him into a conversationalist.

It's fashionable to claim that the reason for this is that these organizations are "culturally incompatible" with all the warmth and goodness that groupware can provide. To wit, companies that don't share information and expertise aren't going to start swapping data just because they've gone on Notes. Professional service firms run by rugged individuals don't all hold hands and sing "Kumbaya" just because they're digitally wired.

That's obvious and inarguable. What is so surprising, though, is just how few organizations behave as if they grasp the essential rule of successful groupware implementations. Designing incentives is just as important as designing technology.

If your organization already is collaborative, cooperative and into sharing information across divisional boundaries, then groupware represents a natural extension of the way you do business. Your implementation problems will be technical and training-oriented. If, on the other hand, the organization is rife with divisional rivalries, turf wars and aggressive intrapreneurs all bidding to make a name for themselves, then using groupware as a medium to get people to work together represents disgraceful management. Giving someone collaborative tools doesn't make him collaborative any more than handing someone a telephone turns him into a conversationalist.

You want to change how people collaborate? Don't just hand them different tools; offer them appropriate incentives. Why should someone post useful information on a Notes database if someone can expropriate that nugget — without giving credit — for the presentation? If two divisions are maneuvering for the same slice of the corporate budget, just how transparent do they want to make their proposals to their in-house rivals? Do the benefits of cooperation outweigh the costs of competition?

The obvious response to this, of course, is "What the heck does IS know about designing incentives for collaboration?" Exactly! That's precisely why IS has to insist from the very beginning that groupware isn't just about transparency, replication and semi-structured databases. It's about how individuals are rewarded and punished for sharing and/or withholding information. The honorable, ethical thing for most IS organizations to do when they're asked to bring groupware to the enterprise is insist that a system of incentives be phased in right alongside the technical implementation to help ensure the technology is actually used in the way the organization thinks it wants.

Maybe individuals whose work is cited, referenced or downloaded the most could get cash awards. Perhaps managers whose workers don't draw upon the resources of the network could be reprimanded for not pushing professional development. No matter. The dirty little secret of today's groupware implementations is that most IS departments view incentives as irrelevant to their groupware missions, and they lack either the competence or courage to insist that their companies explicitly address this issue. That's not just uncollaborative behavior; it's unprofessional, as well.

A research associate at MIT Sloane School and Media Lab, Schrage has written *No More Teams! The Dynamics of Creative Collaboration*, recently published by Doubleday Currency.

Cry for information access

Marcia Blumenthal

Give me access to information to make better decisions — and give it to me *now*. This is the call for action from high-level management and chief information officers' peers, who appear to be dissatisfied with the progress CIOs are making in giving them access to information that will help them make better business decisions.

The inability to deliver information is a continuing factor in the credibility gap between CIOs and top management. The crying need to do business process re-engineering and the technical need to move to client/server can provide a way for the information executive to diffuse a highly charged political situation. Those factors also give CIOs opportunities to prove themselves strategically important to the enterprise.

An annual survey of executives by Ernst & Young and *CIO* magazine revealed that CIOs' superiors and peers rated accessing corporate information and managing the information environment as top concerns. But a major discontinuity exists here because those executives don't see information systems playing a leadership role in providing these services. Another survey, this one conducted by Deloitte & Touche, found that 71% of 400 CIO-type respondents were dissatisfied with legacy systems' inability to give them access to management information.

IS can enable access to management information and to the technologies that play a major role in making that information available.

Hmmm, sounds like a really big opportunity. But there's a caveat.

Everyone plays a role

As John Tyler, senior vice president and chief technology officer at Houghton Mifflin puts it, no one business unit manages information. Information is used across the enterprise. Hence, CIOs and other executives are skittish about where IS stands when it comes to bringing the enterprise into the competitive forefront — making information easily available to all corporate denizens.

CIOs can certainly be key members of the interdenominational teams that determine what information is needed enterprisewide. In many situations, this is already the case, but it is necessary to have top management and peer executives understand that this is the way to proceed. The perception of reality is at least as important as what really goes on in an organization.

Furthermore, IS can enable the implementation of access to such information and to the technologies that help make that information available, whether it be electronic data interchange, E-mail or imaging.

For years now, a debate has been raging in the IS community: Are CIOs leaders or just enablers when it comes to the IS mandate? As more than one IS executive has noted, you don't wait to get invited to the strategic planning table. One journalist colleague of mine expressed the idea wonderfully, with a sign on his office door that said "barge right in."

IS executives have also been chided for not speaking business lingo or expressing the bottom line in how IS adds value to the enterprise. In fact, this has been the talk within the

Blumenthal, *page 38*

Cobol forges ahead

David E. McFarland

Cobol has been declared dead dozens of times over the past 35 years. Considering what we read about it, the language must finally be dead and gone.

Since Cobol's development in 1959, many languages have been invented to replace it. In the early 1960s, there was APL. In the mid '60s, PL/1 was promoted by the colossus of IBM as the only language you would need in the future. By the late '60s, Basic was on the scene, and in the '70s, Pascal was thought to be the answer. More recently C and C++ were crowned as the solution.

Each time new languages arrive, many companies blindly adopt these saviors and press ahead. Often they drop the new language and return to Cobol. This brings up questions of why they switch and why they give up and return to Cobol.

Most switch because of the promise of improved development productivity. There are several reasons for their return. Many new languages are not industrial strength. They are excellent for a 10- to 50-line program, but fall down on a 500,000-line system, or they handle a 100-record file fine but not a 10-million record file.

It turns out that the development of Cobol was very well done. It is extremely difficult to design a language that is elegant, to the point and self documenting at the same time. Cobol is such a language. C, APL and PL/1 are good contra examples.

Why are the trade journals so heavily oriented toward the new savior of the day? It could be a side effect of the tremendous amount of money spent on promoting new technologies. There is an impression that people will be more attracted to the new whiz bang than the evolution of the old standby. It's true that many of these new tools have some great ideas, and some deserve a place in the development world.

There are more than 3 million programmers in the world, about 80% of which are Cobol programmers. So obviously Cobol is alive and doing very well.

Dominant language

According to Gartner Group, there are more than 240 billion lines of code in all languages, about 80% of which is Cobol. There are more than 3 million programmers in the world, about 80% of which are Cobol programmers. So obviously Cobol is alive and doing well.

During the 1980s, Cobol vendors did not increase the number and sophistication of their development tools to satisfy user wishes.

More recently, Cobol vendors are providing sophisticated enhancements utilizing new concepts. Application generators, not unlike database front ends, are now available. Screen and graphical user interface generators, object orientation and graphics capabilities are here. Client/server access from Cobol is now commonplace.

The Cobol compiler vendors and tool providers will continue to modernize the fleet to enable the world to access the tremendous volume of legacy data and take advantage of the huge base of Cobol programmers. How expensive is it to retrain these productive programmers in a tool that is no more effective than modern Cobol?

Information systems management should be careful about wandering off using new development languages without verifying they are industrial strength and well proven.

McFarland was a cofounder of Ryan-McFarland Corp. Today he is director of The Cobol Foundation in Indian Wells, Calif., a consortium dedicated to educating the industry on the status of Cobol.

Blumenthal

CONTINUED FROM PAGE 37

community for the past 20 years or so. Enough already.

Overcoming this process is not easy. As one IS executive at a utility company said, changing the corporate culture is the most difficult and frustrating task he has ever encountered. When the chief executive wants to wear a tie on Friday and the rest of the company is enthusiastic about a "casual day," change dynamics become daunting. The solution brings to mind Bill Murray in the movie *What About Bob?* — take one little baby step at a time. This approach to change may be slow, but it can be a powerful mode of operating, and successful information executives often employ it.

> **The inability to deliver the information goods is a continuing factor in producing a credibility gap between the CIO and top management.**

Empowerment of executives and workers has altered the meaning of information. Rethinking what information is and how it will affect the organization is a critical task not confined to the IS ranks. But who has a better overview of how a system works and what systems mean to the enterprise than the folks in IS?

Blumenthal was founding editor of *CIO* magazine. She is a high-tech journalist and consultant in Newton, Mass.

In business, slow is not an option. If you're looking for

- EIS/Data Warehousing
- Rapid Application Development
- Client/Server Applications

Speedware Corporation is an international organization with thousands of satisfied customers and products with a proven track record.

It's a small world

i cannot concur with the juggernaut-like image nf the coming information technology workplace that "Hello, cruei world" [CW, May t5] presents. i feei the changes it foresees are long overdue and will benefit those employed as "infnrmatino society technicians."

Only one-third nf the workforce is employed at firms with more than 50 employees. That means that two-thirds are working at smaller, more focused, less stable companies — like the great majority of construction industry workers.

Are carpenters devoid nf professional honor simply because their professinn happens to consist mostly of contracted positions? Do we assume that architects and doctors suffer because they have no "company" to be loyal tn? These workers aren't stealing groceries because they can't work fnr huge bureaneratic organizations.

Maybe we'd be better off if we let information workers provide services in an npen market. We may find that we are better able to serve our customers if we have to market our products based on nur individuat merits.

Jim Bair is quoted as saying, "The world is changing from a caring social place to nne of total Darwinian natural selection." Yet it is only the past 200 years that have provided the "security" nf bigger enterprises to significant percentages of any population.

Michael MacDonald
Oakland, Calif.
michael_medonald@ccgate.apl.com

Groupware works

I was taken aback by Jeffrey Henning's "Groupware dilemma" [CW, April 24], which oversimplifies groupware as "the next big thing" that management has "latched onto."

I can speak directly of a very successful implementation of one of the products Henning maligns. Notes has become the backbone of some of our most important business processes, especially in sales-force automation.

To be effective, groupware must have more to offer than electronic mail and database management: It must have an architecture that offers scalability, reliability and manageability. It also must nffer an open application development environment, a robust message tranafer agent, a rich object store, rigorous security and replication for geographically dispersed and mobile workers.

Notes has helped improve our communication, collaboration and coordination regardless of geographic location. It has allowed the sales force to share critical information more efficiently and effectively, and that has reduced response time and improved customer service.

Michael G. Meade
Senior vice president, MIS
Mortgage Guaranty Insurance Corp.
Milwaukee

OS/2 is an also-ran

I was amused at reader David McKinney's incredible statement, "I hope Windows 95 makes it out this year so OS/2 can dispatch it as easily as it did NT" [Letters to the editor, CW, April 24]. OS/2 dispatched NT? That's certainly news to me, because from all indications that I can see, Windows NT is ative and well.

The mnmeotum Microsoft is gaining in the corporate enterprise market is significant. One reason these products are so well-thought-of is their outstanding connectivity features, an area in which OS/2 falls shnrt.

A more mainstream view might be that Microsoft will continue, even strengthen, its dnminance of the desktop as Windows 95 and Windows NT converge over the next several years. I expect OS/2 — assuming it somehow manages not to lose too much ground during this onslaught — to be a low-volume player, installed mainly in organizations whose IS departments are loyal to IBM. Io nther words, exactly what it is today.

Mickey Langley
Lilburn, Ga.
ir000174@interramp.com

Plugging Windows 95

Io "The dawn nf the 32-bit desktop" [CW, April 24], you closely associate LAN connectivity and Windows 95 with plug and play, as if the two are interchangeable. This is misleading. The plug-and-piay feature in Windows 95 allows users to add new hardware of any type, not just networking components, and have the computer automatically configure the hardware and software drivers needed for the new component with little or no user interveation.

You also state that although Windows 95 is a 32-bit system, it is "hampered" by the need to be compatible with Windows' t6-bit software. Windows 95 does contain some 16-bit code, largely to allow many older t6-bit applications tn ruo. However, Windows 95 does allow for much greater handling nf "system resources," which were a frequeat cause of crashes in Windows 3.x. Users who run just 32-bit applications need not worry.

Brian Honey
Parkersburg, W. Va.
bhoney@aol.com

Proceed with caution

As independent business analyst/consultants working in tbe field, we couldo't agree with Bill Carico more ["The CEO's roie in IT decisions," CW Leadership Series, April t7].

Tbe majnrity of senior management-dictated clieot/server systems are developed without detailed user requirements or a cohesive external design in free-form, unstructured languages by self-proclaimed egocentric acronym gurus with recent computer science degrees and no practical business experience.

Many nf these systems are ill-conceived, impractical, undocumented, unsecured, unmodifiable and virtually unmaintainable. As evidenced by the high rste of failure, implementation nf these systems could be a serious tactical business hiunder.

This article should be reqoired reading for all levels of information technology management.

Mel and Nancy-Lea Weisberg
Compteche, Calif.
Weisbergs@aol.com

Call us fo the speed you need 1·800·276·9950

SPEEDWARE

Visit us on the World Wide Web at: http://www.speedware.com e-mail: moreinfo@speedware.com

THERE ARE

A LOT OF COMPANIES

THAT CAN PUT YOU

ON THE INTERNET.

UNFORTUNATELY,

THEY'LL ALSO

LEAVE YOU THERE.

[illegible] I can [illegible] opportunity. Unfortunately, [illegible] companies would have you believe that just [illegible] setting up a connection [illegible] the Net. Well there's more to it than that, and we should know. BBN helped develop the Internet more than two decades ago. At Today's BBN Planet is the leading provider of value-added Internet services nationwide. We don't just give you access. We provide world-class network operations support, extra [illegible] and true end-to-end [illegible]. So your customers can get [illegible] they need [illegible] they're [illegible]. Visit our [illegible] page at http://www.bbnplanet.com, call us at [illegible] or e-mail info@bbnplanet.com.

BBN Planet

[illegible]

InVircible: Invincible or irresponsible?

Industry divided over PC virus protection product

By Gary H. Anthes

Everyone agrees that the InVircible PC virus protection product is oddly named, but there is little accord on anything else. The product has sparked threats of lawsuits and Internet flame wars as bad as they get.

Its strongest adversaries call InVircible a dangerous Trojan horse, while milder critics say it represents a flawed implementation of some clever ideas.

Meanwhile, a loyal band of users swears that InVircible offers the most effective virus protection on the market today. They say its critics are misinformed or ideologically biased in favor of more traditional antivirus techniques. The shareware product is developed by NetZ Computing Ltd., an Israeli firm.

Some observers straddle the two camps and say users would get maximum protection by installing InVircible on their machines to act as a virus watchdog, while still using traditional virus scanners on new software before the software is loaded.

Last December, a reviewer for the influential "Virus Bulletin" called InVircible "exceedingly poor at virus detection" because it found just 114 of 248 standard test viruses. The reviewer said InVircible's documentation was "prone to making claims which are palpably untrue," and he viewed the product's cleanup feature "with disdain."

Last week, former "Virus Bulletin" editor Richard Ford, now research director at the National Computer Security Association in Carlisle, Pa., gave InVircible a mixed report. "It does provide an interesting method of stopping viruses generically, and there are a lot of useful tools in there," he said. "The problem is they come into play after your PC has been infected, not before."

InVircible enthusiasts said it is unfair to compare the tool with traditional virus scanners — which try to match the digital signatures of suspected viruses against catalogs of known viruses — because it is not a scanner. Instead, it looks for characteristic virus behavior over time, which it elicits by laying out "virus bait" (see story below).

Paul Williams, a data security consultant at Revolutionary Concepts, Inc. in Houston, said InVircible does not scan well but is very good at catching in-progress infections by detecting changes in a PC's files over time.

Williams said he uses a traditional scanner to look for viruses in new software before it is loaded and the scanner catches 96.5% of all viruses. "But 3.5% of viruses will slip by, and InVircible will not only catch those but also repair the damage done by them," he said.

And Williams said InVircible is unmatched in its ability to repair damage because it restores files to their precise original state.

Elf Exploration, Inc. in Houston installed InVircible on all 87 of its PCs after finding that Microsoft Corp.'s virus scanner proved too large to run while the PCs were also running network software. Fred Webster, manager of information services, said InVircible found and cleaned up viruses such as Michelangelo, Stealth, Stoned and Monkey as well as the Microsoft scanner and did it "significantly faster."

A drawback for some people, Webster conceded, is that InVircible will not always identify a virus; it will only tell you it has found one.

Asked about the vocal faction critical of InVircible, Webster said, "A lot of people just don't trust the way it works. It's a subjective feeling. A lot of people just think it sounds too good to be true."

> As of March 31, there were 2,905 computer viruses listed in Patricia Hoffman's Hypertext VSUM on-line directory published in Santa Clara, Calif.

InVircible's author explains

InVircible uses expert systems rules and other techniques to recognize the symptoms of viral behavior rather than look for specific virus signatures as scanners do. Therefore, its proponents claim, it can find new viruses that have not yet been analyzed, and it does not have to be constantly updated with new signatures.

InVircible watches for replication, the basic nature of all viruses. It initiates tests for viral behavior, generates "virus baits," checks for memory stealing and senses "piggybacking" — attempts by the virus to attach to the antivirus software.

"Virus scanners resemble a front door with a fancy alarm system on it, while InVircible is more like a big dog who waits quietly in the house, watches for an intruder sneaking in through the back door and then eats up the intruder before he can steal anything," said Zvi Netiv, author of InVircible and managing director of NetZ Computing.

Netiv said InVircible costs $99 and is distributed as shareware on bulletin boards. He said it can be found at INVB602.ZIP on America Online, GO INVIRCIBLE on CompuServe and http://invircible.com/invircible.html on the World-Wide Web. Four U.S. agents provide sales and technical support, including Vine Computer Industry in Cicero, Ill., Netiv said. —*Gary H. Anthes*

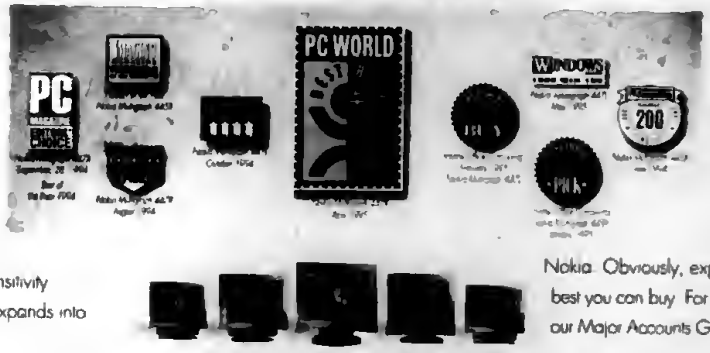
WE'VE ALWAYS SAID OUR MONITORS ARE TRIUMPHS OF TECHNOLOGY.
NOW, IT'S OFFICIAL.

The Nokia 447X has just been named a Best Buy by *PC World*. This adds to a long and growing list of awards and honors for Nokia monitors.

Ever since their introduction in the U.S., Nokia has been recognized by editors and sophisticated users alike as technologically superior in image quality and user-sensitivity.

As the need for quality monitors expands into more homes and businesses, the appreciation of Nokia excellence grows with it. And, as more people look into Nokia, the appreciation of Nokia value grows too.

So if you're considering a new monitor, consider a Nokia. Obviously, experts already consider them the best you can buy. For more information, please contact our Major Accounts Group at 1 800 BY NOKIA.



NOKIA
MONITORS

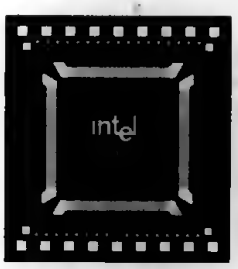
THE NEW ULTRAPORTABLE PORTÉGÉ™.

Toshiba engineers have done it again. Now you can get the incredible speed of a 90MHz Pentium™ processor in an ultraportable. The top-performing Portégé 610CT is packed with all the sophisticated features you'd expect in a full-size computer. A Lithium Ion battery provides up to five hours of use — without a recharge. Add to that, a spacious 720 Million Byte HDD, a large 9.5" diagonal color display, two stacked PC Card slots, a captivating sound system and an optional Port Replicator for one-step connection to your desktop. See how far Toshiba has taken every aspect of portable computing. And think where it can take you. **Call 1-800-457-7777 for your nearest dealer.**

PORTÉGÉ™ 610CT

Up to 5 Hours of Battery Life

MINIMIZE MASS. MAXIMIZE ACCELERATION.



90MHz Pentium™ Processor

The Portégé legacy. *The Portégé series has won prestigious awards including PC Computing's Product of the Year and Portable MVP and PC Magazine's award for Technical Excellence.*

PC Card expandability. *Two stacked PC Card slots (two Type I-II or one Type III) leave your options for storage, fax/modems, networking and the future wide open.*

PORTÉGÉ 610CT FEATURES:

- 90MHz Intel Pentium™ processor
- 9.5" dia. 24-bit color TFT active matrix display – 16.7 million colors
- 720 Million Bytes (=686MB) HDD
- 8MB RAM, upgradable to 40MB
- VL local-bus video
- Integrated 16-bit Sound Blaster™ compatible sound system
- New enhanced Lithium Ion battery
- Two stacked PC Card slots (two Type I-II or one Type III)
- AccuPoint™ integrated pointing device
- External 3.5" 1.44MB floppy drive
- 4.8 lbs. – 9.9" x 7.9" x 2.0"
- Optional Port Replicator
- DOS, Windows® for Workgroups, MaxTime® Power Management and Fn-ese™ software
- Toll-free technical support — 7 days a week/24 hours a day

In Touch with Tomorrow

TOSHIBA

Toshiba. The World's Best Selling Portable Computers.

© 1995 Toshiba America Information Systems Inc. All products indicated by trademark symbols are trademarked and/or registered by their respective companies. The Intel Inside logo is a trademark of Intel Corporation

If he used our software, he'd be even more flexible.

Let's face it, with reengineering mandates coming out practically daily, it's impossible to be too flexible. Dun & Bradstreet Software's SmartStream® client/server applications feature decision support capabilities and built-in configurable workflow that not only energize your existing business environment, but adapt quickly as your needs change. Call us at 1·800·290·7374, ext. 960, or reach us on the Internet at solutions@dbsoftware.com.

FINANCIALS HUMAN RESOURCES MANUFACTURING DECISION SUPPORT

© 1995 Dun & Bradstreet Software Services, Inc

B TOOLS FOR MANAGING THE DATA WAREHOUSE

C PLUS WAYS TO EXPLOIT THE NEWLY ACCESSIBLE DATA

C **FREE!** BLUEPRINT FOR DATA WAREHOUSING SUCCESS FROM SAS INSTITUTE

D DATA WAREHOUSING THE BACK END IS JUST THE BEGINNING

THE SAS®

MANAGEMENT**REPORT**

NEWS TRENDS OPINIONS AND IDEAS FOR INFORMATION MANAGERS

HOW TO BUILD, MANAGE, AND EXPLOIT A DATA WAREHOUSE *(WE'LL GIVE YOU THE BLUEPRINT FREE)*

The strategy, says Randy Betancourt – SAS Program Manager, Data Warehousing – can be found in software that:

- **Offers a single-tool approach for integrating all the core technologies involved in data warehousing, from back-end access to legacy systems to front-end decision support and business intelligence capabilities.**
- **Holds down costs by capitalizing on resources you already have...and by seriously re-evaluating the need for an expensive RDBMS.**

To meet the needs of business decision makers, information managers are looking for ways to provide direct access to a wide range of corporate data stored in many different sources and data formats

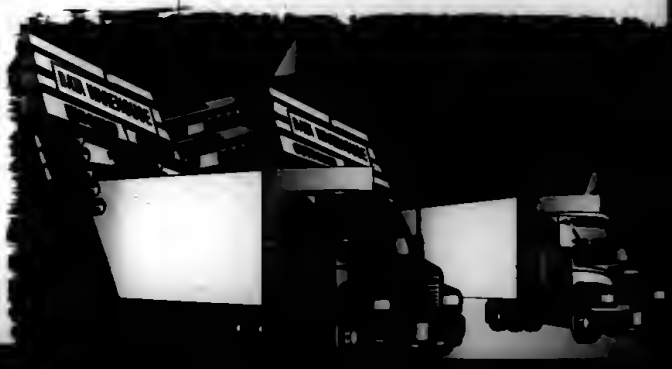
In doing so, IT professionals face the challenge of making data easily accessible, without impacting the performance of vital operational systems or compromising data security The solution they're turning to is data warehousing

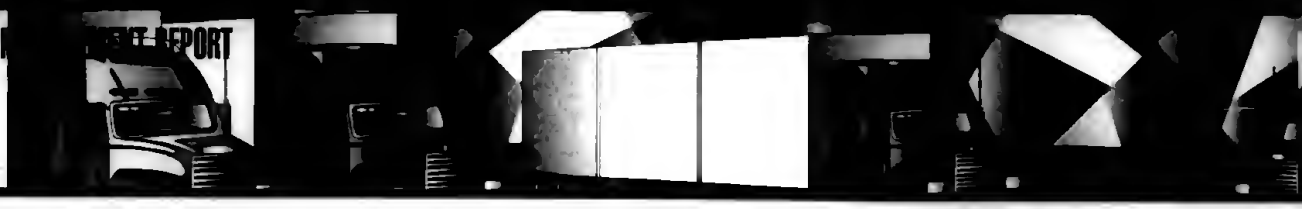
"Data warehousing is a strategy and a method for physically and logically separating operational data from decision support data. This decision support data is derived from the operational data, but is continually refreshed and readily accessible to end users, who can get to the business information they need without impacting operational systems," says Betancourt

"At SAS Institute, we're helping business decision makers gain access to legacy data, then integrate and transform that data into meaningful information "

SAS Institute is "the only vendor out there that's providing a complete end-to-end software solution for accessing, managing, analyzing, and presenting data," asserts Betancourt, who points to the SAS® System of software's leadership role in three major areas

(continued on next page)





ACCESS TO LEGACY DATA AND TRANSFORMATION TOOLS

"The SAS System grew up in the mainframe environment," says Betancourt, who quickly adds that SAS software's hardware-independent structure now takes it seamlessly from Big Iron to your favorite desktop. "We have a strong affinity for legacy data such as IMS, IDMS, CA-DATACOM/DB®, DB2®, VSAM, and sequential files. And we've made these data stores readily accessible, since there's a substantial investment there."

Direct links to a variety of data sources are built into the SAS System, together with a fourth-generation language that makes transforming data as straightforward as possible. In fact, SAS software provides a relational model for data management similar to the commercial relational database management system (RDBMS) suppliers

TOOLS FOR MANAGING THE DATA WAREHOUSE

"In setting up a data warehouse, many customers assume their first decision is to buy a relational database management system to store the data for the data warehouse," says Betancourt. "Truth is, data warehousing simply does not require many of the features of a database management system."

He explains that "relational database management systems have been optimized for online transaction processing – with facilities such as two-phase commit, rollback and recovery, and other database features. Data warehouses, on the other hand, are intended to be *read only*. There is no update that takes place from the user perspective. Data warehouses are loaded from transaction systems and periodically refreshed from the incremental transactions. Many of the facilities associated with traditional database management systems are merely overhead in a data warehousing environment."

Randy Betancourt, SAS Institute Program Manager for Data Warehousing

Betancourt adds that SAS data structures are relational in nature and have all the requisite features necessary for data warehousing including indexing, compression, and a security model

"SAS software has the right capabilities, but doesn't consume overhead for facilities that are not needed," he explains. "Coupled with the fact that most companies have SAS software already installed, you could say many organizations are well on the way in reaping the benefits of data warehousing without having to invest in new technologies. And, even if an organization is licensing SAS software for the purpose of data warehousing, the cost – in relation to the cost of a full-fledged database management system – is much less."

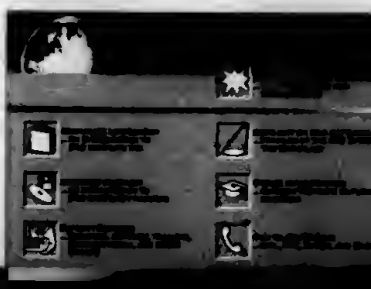
PLUS WAYS TO EXPLO THE NEWLY ACCESSI DATA

"The net takeaway from building a data warehouse is empo with information to make better, more informed business d says Betancourt. "SAS Institute has always excelled in the decision support. There is no other company with more exp delivering critical business information to decision makers enterprise."

He adds that most vendors offering tools for exploiting the house support Windows™, and occasionally OS/2® and U that SAS Institute's software runs seamlessly across more hardware platforms from the desktop to the Data Center.

"Any application written in one environment can be easily in any of the others," Betancourt explains, "with each pa application running where it makes the most sense. So, viding a complete end-to-end solution for data warehous SAS System addresses an organization's client/server com as well."

VISIT SAS INSTITUTE ON THE W WIDE WEB AT http://www.sas.



IT
BLE

wering users
ecisions,"
area of
erience in
across the

e data ware-
NIX®, but
than 25

executed
rt of an
while pro-
ng, the
puting issues

VORLD
.com/

SAS INSTITUTE OFFERS FREE BLUEPRINT FOR DATA WAREHOUSING SUCCESS...

"Building a successful data warehouse requires a proven plan and a solid foundation," says Data Warehousing Program Manager Randy Betancourt. "That's why we are pleased to offer information managers a blueprint for simplifying data warehouse construction, and for saving money in the process."

The 8-page plan, called *A Blueprint for Data Warehousing Success*, is available FREE.

...PLUS A FREE SUCCESS STORIES VIDEO

We've compiled success stories from leading companies that have initiated data warehousing strategies

To receive the blueprint, the video, or both, contact SAS Institute at 919-677-8200.

You can also request these materials using the attached postpaid reply card.

DATA WAREHOUSING SURVEY

We'll report your responses in an upcoming issue of SAS® Management Report

CLIP AND MAIL TODAY. POSTAGE IS PAID.

1. Do you see data warehousing on the horizon at your company?
   ____ Yes ____ No ____ Not Yet
2. Do you see data warehousing as an effective vehicle for giving decision makers easy access to corporate information? Why or why not?
   _____
   _____
   _____
   _____
3. Are you using SAS software in your data warehousing projects?
   ____ Yes ____ No ____ Not Yet

PLEASE SEND ME:

☐ SAS Institute's free ***Blueprint for Data Warehousing Success***

☐ The free video, ***Success Stories***

Name _____

Title _____

Company _____

Address _____

City _____ State/Zip _____

Phone (____)_____ Ext ____

CW

USE THIS CARD TO TAKE PART IN OUR DATA WAREHOUSING SURVEY...

And to receive your free blueprint and video

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO 64 CARY, NC
POSTAGE WILL BE PAID BY ADDRESSEE

ATTN SOFTWARE SALES & MARKETING
SAS INSTITUTE INC
100 SAS CAMPUS DRIVE
CARY NC 27513-9905

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

PERSPECTIVE
RANDY BETANCOURT

DATA WAR
THE BAC
THE BEGI

I'm often asked to sum up SA
warehouse. Simply put, we be

- **To present a "single versio**
  maintainable, current, and
  business users.
- **To reduce interruptions of**
  trate on effective data del
- **To empower business users**
  ing their own information

The SAS System Three

EHOUSING: K END IS JUST INNING

S Institute's philosophy for building a data
lieve the goals of data warehousing are:
n of the truth" that is consistent, secure,
l easily accessible for a wide range of

IS personnel, allowing them to concen-
ivery strategies.
s to become more self-sufficient in meet-
needs.

-Tier Computing Architecture

To achieve these goals, we've developed our own blueprint for data warehousing success. It's a blueprint that enables organizations to leverage their investments in existing technology as well as exploit their existing SAS modules. Take a look at this blueprint and you'll discover that SAS Institute is the *only* provider of end-to-end data warehousing solutions. Here's a preview.

The Back End: Accessing the Data

The first step in building a data warehouse is accessing operational data from wherever it resides, and in whatever format it embodies. SAS Institute provides a powerful 4GL coupled with access methods that tap directly into a variety of legacy databases -- more than 50 different data structures across diverse computing environments, from xbase files on the desktop to DB2® on the mainframe.

Managing the Data: Preparing for Business Analysis

Once accessed, data must be transformed into a consistent, integrated form. This process involves cleaning, reconciling, de-normalizing, and summarizing data -- and then loading the data into logical data views that can be surfaced into a variety of analytical and reporting applications.

The Front End: Exploiting the Data

A data warehouse without sophisticated access, analysis, and reporting capabilities is like a library without a card file. SAS Institute software provides comprehensive tools in all these areas. Once you have the data in the warehouse, you can rely on SAS software's integrated capabilities for data query and reporting, OLAP/multi-dimensional analysis, data visualization, presentation graphics, and more.

From front-to-back, SAS Institute provides the breadth of functionality necessary for successfully implementing a data warehouse. Our free data warehousing blueprint explains it all...see page C for details.

SAS®

SAS Institute Inc.
Phone 919-677-8200
Fax 919-677-4444
Email cw@sas.sas.com
In Canada, 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc. Other brand and product names are trademarks or registered trademarks of their respective owners.
Copyright 1995 by SAS Institute Inc.

IBM eases Windows-to-OS/2 port

By Lisa Picarille
NEW ORLEANS

Attempting to help itself by helping others, IBM recently announced marketing and technical initiatives designed to help developers easily and quickly get their software onto the OS/2 platform.

The announcements, made at the IBM Technical Interchange conference held in the Big Easy, reinforced how the company's repeated efforts to attract developers to its OS/2 operating system have been anything but easy.

A breakthrough came with IBM's promise to release a set of application programming interfaces (API) that will ease the porting of Windows applications to OS/2. This set of APIs, called Developer API Extensions, will be available to OS/2 developers in August and will be included in a future version of OS/2.

The Developer API Extensions let Windows developers reuse about 80% of the code from their Windows products when they create OS/2 versions of applications. The remaining 20% of the APIs needed to move to OS/2 must be programmed specifically for OS/2. Using these APIs reduces development time by several months, an IBM spokesman said.

To create these APIs, IBM worked with Lotus Development Corp. in Cambridge, Mass., to identify the most commonly used Windows APIs and isolate the 700 calls that are similar between Windows and OS/2.

IBM also licensed a tool from OneUp Corp. in Dallas that automatically converts 16- or 32-bit Windows code to OS/Warp code. Called the Source Migration Analysis Reporting Toolset, the product analyzes the scope of the conversion effort and indicates to developers which parts of their Windows application will use IBM's Developer API Extensions.

These tools make it straightforward for developers and gives them access to more than 9 million OS/2 users, said Wally Casey, director of marketing at IBM's Personal Software Products group.

IBM is also moving into the next stage with its Executive Call Program, an initiative spearheaded by Chief Executive Officer Louis V. Gerstner (see chart) to attract third-party developers.

Phase two is a 14-to 16-month program offering technical and marketing assistance for third-party developers. Some of the programs include a "Try and Buy" CD-ROM to be sold at retail locations, a direct-mail campaign to promote independent software vendors' products and assistance in creating a presence on the Internet, said Howie Hunger, director of relationship management at IBM Solution Developer Operations group.

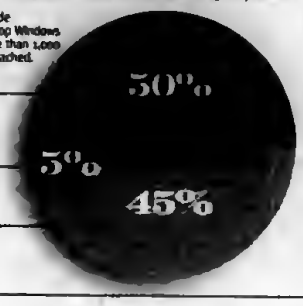
Other IBM initiatives included the following:

- Released earlier this month, Warp Connect is aimed at users with peer-to-peer networking capabilities, remote access features and enhanced TCP/IP support for dial-up or LAN connections to the Internet and on-line services.
- IBM will take on Microsoft Corp.'s Windows NT Server later this year by delivering Warp Server, a combination of Warp and IBM LAN Server.
- IBM has signed a worldwide marketing deal with Raleigh, N.C., start-up Blue Orchard Software, Inc., a spin-off of Indelible Blue. Blue Orchard will be responsible for selling OS/2 applications into the channel under a newly created WarpWare logo. WarpWare aims to establish brand-name recognition at the retail level by grouping OS/2 consumer and small business products and identifying them under the WarpWare banner. IBM claims that more than 50% of OS/2 sales since Warp's introduction last November are in the home and consumer markets.

Dialing for developers

Several weeks ago, IBM CEO Louis V. Gerstner sent his top executives to the telephones to call the top Windows developers and persuade them to also develop for OS/2. According to Howie Hunger, director of relationship management at IBM Solution Developer Operations group, Gerstner's Executive Call Program resulted in the following responses:

120 top IBM executives made approximately 1,200 calls to top Windows developers. IBM claims more than 1,000 developers were actually reached.



"Very positive and very interested in working with us, and we are now engaged in discussions with them."

Essentially said they are not interested. "They didn't really see any reason to have a further discussion."

Had "a desire to continue a dialogue, but they had some questions and some issues" that IBM is currently working on.

A quick roundup of Windows 95 news

It's official – sort of. **Microsoft will release Windows 95 on Aug. 24,** a company spokeswoman confirmed. The locale for the expected gala rollout, however, is still unknown.

Soon after the official release, Microsoft will provide regular updates to Windows 95. These will be available over The Microsoft Network or via a subscription service.

Not officially named yet, these so-called "tune-up packs" will enable Microsoft to ship new features as soon as they are ready, said Yusuf Mehdi, a product manager at Microsoft's Personal Systems division.

For example, that's how Microsoft will deliver the promised support for Novell's NetWare 4.1 NetWare Directory Services, a protocol stack for IBM 3270 and additional device drivers, Mehdi said.

Soon after Windows 95 ships, the company will ship Version 4.0 of Microsoft Money, said Leslie Koch, unit manager for personal finance software.

Despite the long-pending and now dead acquisition of Intuit and its product Quicken, Microsoft's commitment to the next version of Money never flagged, Koch said. "We always treated it as if we wanted to beat Quicken," she added.

The new version will look a little like the company's Encarta multimedia encyclopedia, with large graphical buttons and fewer drop-down menus. "It has the same kind of navigation model as Encarta," Koch said. "We've made the product more friendly." Money 4.0 will also put more emphasis on home banking and bill paying features.

– Stuart J. Johnston

NEC unveils servers for Windows NT

By Jaikumar Vijayan

For the immediate future, at least, servers based on Microsoft Corp's Windows NT operating system are playing catch-up to those based on other operating systems, according to analysts. Issues include a dearth of Windows NT networking software and development tools, among other things.

These concerns are not stopping vendors from introducing NT-based servers. NEC Technologies, Inc. in Boxboro, Mass., is the most recent player in this arena (see box at right).

A recent report from Gartner Group, Inc. in Stamford, Conn., predicts that NT servers will outsell Unix-based servers as early as 1996. Most of the demand for this class of server will come from networking and database applications in distributed server environments, the report said.

The report also said NT-based servers are unlikely to scale beyond two to four processors for the next 18 months. "NT scales well, but the application subsystem [such as RDBMSs] must be adapted to NT for scalability, which will take time," the report said.

Indeed, NT-based servers are still not displacing or matching traditional midrange system performance, said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass.

"There are still major holes in systems and network management, in communications protocols and development tools," Kusnetzky said.

More accepting

Because of such concerns, NT servers are likely to find faster acceptance in areas "where there are no installed-base migration issues," said Ted Julian, editor of the "Gray Sheet," an industry newsletter in Framingham, Mass. These applications will include newer areas such as Internet servers, Julian said.

As NT boxes fight to make inroads, RISC boxes such as NEC's may find the going particularly tough, the Gartner report said.

"NT's success will be limited largely to Intel-based servers and supersservers," the report said, because the bulk of NT's software applications will not be ported to RISC platforms and will be available only for Intel Corp. boxes.

Chipping away

Not all hardware vendors are betting on Intel horsepower to get them on the Windows NT bandwagon.

For instance, NEC announced a new quadprocessor NT server powered by Mips Technologies, Inc.'s 200-MHz VR 4400 RISC chip. The new NEC RISCserver 4200 is being positioned as a Windows NT platform for enterprise-level server applications and will top the company's line of RISC-based symmetrical multiprocessor servers.

NEC's RISCserver 4200:
Sample configurations and prices. Systems are based on Mips Technologies' 200-MHz VR 4400 chip.

Number of chips	RAM (M bytes)	Hard drive (G bytes)	Price
2	64	2	$24,734
2	128	2	$34,829
4	256	7	$68,719

According to Tony Levy, NEC's director of product marketing, the new system, which integrates Microsoft's Windows NT Server and BackOffice, will give users "optimized" database transaction processing, document imaging and management and data analysis.

The company will also bundle Microsoft's SQL Server as well as document imaging and data analysis software on its high-end system. *—Jaikumar Vijayan*

Nina Kawalek

Flextime optimizes help desk

Burnout is a fact of life on many help desks and call centers, but it doesn't have to be. Today's re-engineering techniques and the changing job market provide an easy, cost-effective cure. Start by looking for help desk personnel in the professional ranks.

Burnout can afflict representatives who answer users' calls on a full-time basis. In an effort to lessen stress, some companies assign help desk representatives multiple jobs such as hardware upkeep, technical writing and software testing — in addition to phone duty. Unfortunately, the "multiple activity" approach results in inefficiency, inflated compensation and low staff utilization. Also, it's not very flattering to regard support reps as part of an "available staff pool" rather than as communications specialists. A better solution lies in applying basic re-engineering thinking.

A first step of re-engineering is to identify basic functions, goals and skills: Excellent telephone communication skills — efficiently provided in periods of substantially less than 40 hours per week — can improve employee morale and help desk performance. Help desk managers, therefore, should seek candidates with exceptional oral communication skills who would enjoy phone service 100% of the time and are available in limited time slices.

By contrast, hardware maintenance requires technical expertise and attention to detail. Technical writing requires communication skills, but not of an oral or interpersonal nature; clarity and brevity are key here. Testing requires attention to detail, virtually no communication skills and high problem-solving ability. Each of these skill sets is notably different from that of the help desk professional. In rotating help desk representatives through these jobs, management fails to leverage the representative's unique interpersonal skills and blocks the recipient departments from hiring optimally skilled workers.

Varying work as a relief for help desk representatives isn't the answer; part-time scheduling is the solution.

With today's employer/employee relationship, part-time work has become respectable. Having weighed the personal costs of full-time work in corporate America, many professionals have vowed to lead a more balanced life and are combining consulting, part-time work and early retirement.

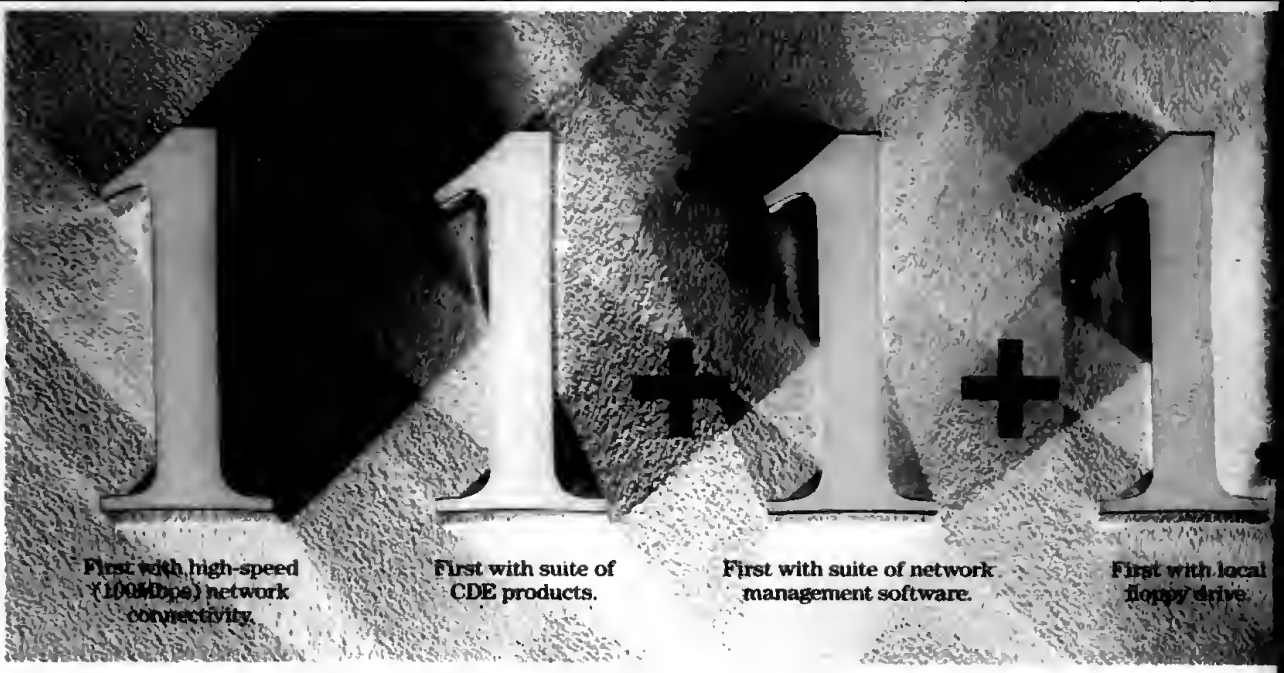
Would you believe people of executive caliber would welcome part-time hourly work on a support hotline? Yes, it's true. Consultants like to smooth out their chargeable hours. Former executive parents spending time with their children welcome continued interaction with the business world. Twenty hours per week or less on the help desk is just right for many emancipated professionals. And could you find more experience than your own company's retirees?

Part-time pluses

Hiring a part-time, flexible work force has advantages. First, burnout is eliminated. Second, 100% utilization is achievable because you can ask part-timers to work or not work depending on shift, day and seasonal call volumes. Third, total compensation costs for part-time help are as much as 40% less than for full-time workers because benefits, vacation and overtime are taken out of the equation.

Fire the full-time reps? No. But keep prescreened candidates ready. When voluntary attrition takes its course, fill each vacancy with two part-time reps. And if you use the help desk as a boot camp for other jobs, graduate all the plebes immediately. Otherwise you send the wrong message to the organization. Wake up. Software support, like any other specialty of the company, is a skilled profession.

Kawalek, a software company re-engineering specialist, can be reached at nmkawalek@aol.com.



The ones to look for in X term

*7 of 8 categories. **Units and revenues. International Data Corporation and X Business Group. ©1995 Hewlett Packard Company

PowerQuest Corp. has introduced PartitionMagic for DOS and Windows.

According to the Orem, Utah, company, PartitionMagic lets users manage and reconfigure DOS and Windows hard drive partitioos in minutes. Users can also visually shrink, expand and move hard disk partitions without destroying data.

PartitionMagic for OS/2 and DOS is also available.

PartitionMagic for DOS and Windows is available in a personal license package for two machioes and a site liceose package. Pricing starts at $99.

▶ *PowerQuest*
(801) 226-8977

Logicode Technology, Inc. has introduced the 14V14HV (internal) and the 14V14XV (external) voice-interactive fax/data modems.

According to the Camarillo, Calif., company, the 14V14 series incorporates data, fax and voice-mail capabilities.

The modems have autodetect features that distinguish betweeo incoming faxes and voice messages and can save and play back messages for up to 999 individual users.

The 14V14HV modem costs $159. The 14V14XV modem costs $189.

▶ *Logicode Technology*
(805) 388-9000

QlikTech, Inc. has anoounced QlikView 1.3, a data access and analysis tool for Microsoft Corp.'s Wiodows 3.1 and Windows NT.

According to the Duxbury, Mass., company, QlikView 1.3 lets osers find and track all associations among data from several sources without osing indexes. Data can be loaded as flat files or accessed through Open Database Connectivity. Users can also add data, including text, images, voice and videos.

QlikView 1.3 stores and displays only unique values in each record field. By highlighting a set of values in one field, the corresponding values in all other fields are highlighted.

QlikView 1.3 costs $895.

▶ *QlikTech*
(617) 934-0229

Jetsoft Development Co. has annoonced Art-Scan Professional 3.55, a scanning software program.

According to the Cincinnati company, Art-Scan Professional 3.55 enhances the capabilities of image scanners with a variety of image enhancement tools. It can reproduce color or black-and-white photographs, text and line art at any resolution from 50 to 9,600 dot/in.

Art-Scan Professional 3.55 offers line-art enhancement capabilities to enhance reproductioo of logos, graphs and documents. It has a vector line art utility that lets users scan directly into EPS or vector-based files; resulting files can be opened in layout or drawing programs.

Art-Scan Professional 3.55 supports more than 100 scanners and is available in Macintosh and PC versions.

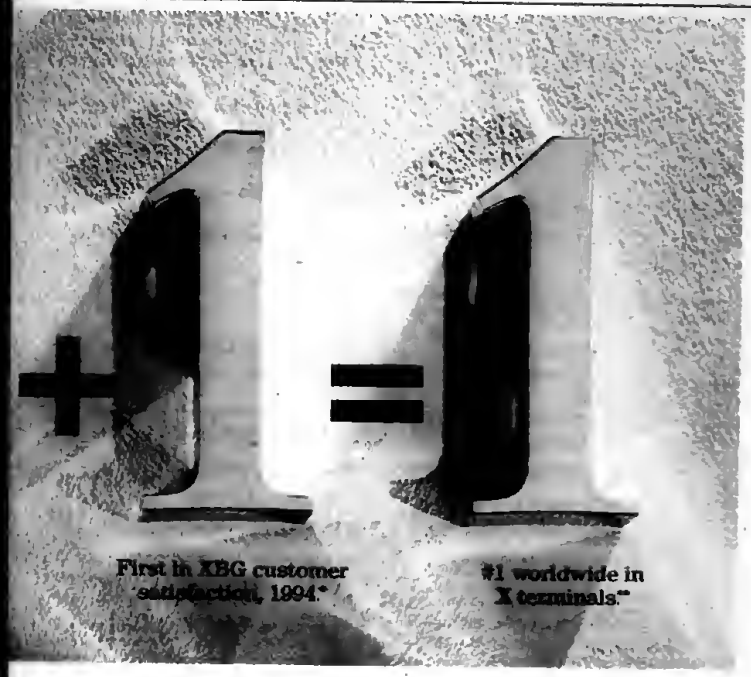
Art-Scan Professional 3.55 costs $150.

▶ *Jetsoft Development*
(513) 528-8668

Another season, another Pentium

It's a sunny honeymoon for notebook vendors looking to make market whoopee with Intel Corp.'s new mobile Pentiums. Intel released a dual-volt 2.9V/3.3V 60/90-MHz Pentium and a dual-volt version of its 50/75-MHz Pentium.

Vendor	AST Research, Inc.	Dell Computer Corp.	Hewlett-Packard Co.	Toshiba America Information Systems, Inc.
	Irvine, Calif.	Austin, Texas	Palo Alto, Calif.	Irvine, Calif.
Product	Ascentia 950N	Latitude XPI	OmniBook 5000	Portege 610CT
Processor	50/75-MHz Pentium	60/90-MHz or 50/75-MHz Pentium (2.9V/3.3V)	60/90-MHz Pentium	60/90-MHz Pentium
RAM	8M bytes, expandable to 40M bytes	8M bytes, expandable to 40M bytes	8M bytes, expandable to 64M bytes	8M bytes, expandable to 40M bytes
Hard drive	500M, 810M or 1.2G bytes	340M, 520M, 810M or 1.2G bytes	1.2G bytes	720M bytes
Weight	6.4 pounds	6.2 pounds	7.2 pounds	4.8 pounds
Price	$3,499 to $5,499	$2,999 to $3,999	To be determined	$4,649



Innovative software functionality, performance and customer satisfaction all add up to one thing: HP is the world leader in X terminals. To find out more, call 1-800-518-6473.

HEWLETT® PACKARD

inal leadership.

You're constantly bombarded with UNIX database claims. Thank goodness for impartial third parties.

IBM DB2® for AIX® was found to be the price/performance leader among UNIX® databases, as you can see from these recent TPC-C™ benchmark results.

DB2 for AIX came out ahead. It performed more transactions per minute, at a lower cost per transaction, with faster response times.

This is not surprising, considering DB2 for AIX was created with the same qualities that made DB2 legendary in the enterprise.

So now that an impartial authority has sorted through all the data, we invite you to call for a copy of the complete benchmark results. Then measure DB2 for AIX against your own tough standards.

IBM: The Clear Price/Performance Leader	IBM DB2 for AIX Ver. 2.1	SYBASE® SQL Server Ver. 10.0.3	ORACLE® 7
Throughput in tpmC	1,410.62	1,275.30	*
Price/performance in $/tpmC	$497	$885	*
90% response times	1.52 sec.	2.44 sec.	*

*Oracle has chosen not to publish TPC-C benchmark results for any platform.

1 800 IBM-3333, ext. GA900

http://www.torolab.ibm.com

4911 Mexico 627-111 Spain 900-100-400 United Kingdom (01329) 242 728 or http://www.ibm.com
of the Transaction Processing Performance Council ORACLE is a registered trademark of Oracle
on an RS/6000™ J30 TPC-C Version 3 Benchmark results published 2/7/95. TPC benchmarks

Horizons unleashes metering with a twist

Chargeback enables price-setting for resources

By Tim Ouellette

Horizons Technology, Inc. is shipping its NetWare LAN metering software with a chargeback feature.

LANrecord 1.0, installed as a Novell, Inc. NetWare Loadable Module (NLM), meters and balances software licenses — both concurrent usage and server-based licenses — across multiple servers and LANs.

San Diego-based Horizons has included the chargeback feature to differentiate LANrecord from competing products. The chargeback feature lets administrators set prices for usage of network resources. Rates can be set for use of server-based applications, data files and software suites, along with network connections and storage.

LANrecord costs $495 for the base server and $295 for each additional server. It costs $795 bundled with Horizons' LANauditor.

At Loral Conic TerraCom in San Diego, network administrator Tom Smith said he was not initially attracted to the idea of chargeback but has found a use for it: exporting the chargeback data to create usage reports for management. The reports, which display usage to monetary terms instead of in technical jargon such as CPU cycles, can help managers see how the network is actually being used.

"What goes on on the network and various computers is a mystery to management," Smith said. He sees chargeback only as an educational tool for buying decisions, not as a reason to bill various end-user departments at the defense electronics company.

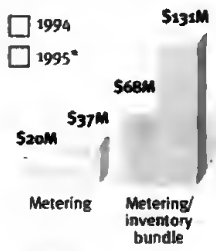
Rick Villars, an analyst at International Data Corp. in Framingham, Mass., said he sees chargeback more as a product differentiator than a major user requirement. "It's not that everyone wants to start charging," Villars said.

But one user said he is concerned more with data files than with applications

Chargeback, *page 52*

The meter is running!

License metering software is expected to see healthy growth this year, but bundles of metering and inventory software are the hot growth area for the market



*Projected

Source: International Data Corp., Framingham, Mass.

Upgraded groupware to come from Novell

By Suruchi Mohan

If Novell, Inc. is able to deliver on time, its groupware strategy may well leapfrog that of rival Microsoft Corp.

Novell plans to release a client/server version of GroupWise, its file-sharing platform, in the first quarter of next year. Code-named Eclipse, it will be known as GroupWise XTD. It will offer many of the features and functions of collaborative computing — mail, workflow, calendaring/scheduling, task management and document management — sitting atop a well-integrated NetWare 4.1 directory.

"Eclipse gives Novell a client/server architecture not just for messaging but for all of information management," said Nina Burns, president of Creative Networks, Inc. in Palo Alto, Calif. "I really like the fact that they will be well integrated with NetWare Directory Services [NDS]. It is not something that Microsoft has achieved."

Microsoft's Exchange Server requires two directories and two management systems, both of which must be maintained, Burns said. Further, Novell boasts a powerful document management system — a package called SoftSolutions 4.1 — which the other messaging vendors lack.

Indeed, document management forms the basis of the information management piece of Eclipse. Information management lets users save, retrieve and file data. Users can pull together information from many different sources regardless of format or application.

Novell's fully integrated document management, messaging and conferencing system, code-named Eclipse, is due by early 1996. It will provide the following:

- Communication management
- Information management
- Work management

Something old, something new

Eclipse's other pieces include communication management, a common desktop to access all the groupware functions and a common set of management and administration tools.

Communication management is an extended messaging capability that allows all kinds of communication to come together, said Bob Young, vice president of marketing at Novell in Orem, Utah. For example, sending a message from a computer to a pager would include the same steps as sending a message from one computer to another, he said.

For the common desktop, Novell espouses the not-so-new idea of the universal in-box. This means that all information — voice mail, electronic mail or fax — would appear in one box and be forwarded in the same way, Young said.

Finally, Eclipse will give network administrators the ability to manage their network from a central console using Nwadmin, the NetWare management tool. Eclipse will support Simple Network Management Protocol (SNMP)-based management so that any SNMP device can manage the network.

Despite all this, Jesse Morris, director of business and office systems at Centocor, Inc., a pharmaceutical company in Malvern, Pa., said he is still unsure what direction his company should take. On the one hand, he said, SoftSolutions and Informs — the forms routing product — are not very well integrated with GroupWise, so the promise of tighter integration with Eclipse is certainly welcome.

But on the other hand, he said, Centocor is not a NetWare shop. Centocor uses GroupWise for messaging. It would need NetWare to take advantage of other features, such as directory services.

"Integration with NDS may not be an issue or may be enough of an issue [for us] to change the [network operating system]," he said.

Sales force automation goes beyond technology

Study says access to corporate data is critical

By Mindy Blodgett

It can be painful, costly and time-consuming, but it is necessary for a profitable, successful sales force.

"It," in this case, is integrating the sales process into the enterprise. And it is necessary for companies to stay effective, according to a recent study.

Summit Strategies, Inc., the Boston-based consulting firm that conducted the study, said integration means arming the salesperson not just with a mobile computer but with access to important corporate data as well.

"Sales force automation — saying 'Here's a $5,000 PC notebook' — is not enough," said James Greene, an analyst at Summit. "The opportunity for profits is much greater if you go at sales in terms of really connecting the corporation with the customer, through the sales force."

That is the philosophy at Nutmeg Mills, Inc. in Clearwater, Fla., a manufacturer of licensed sports apparel.

Right here, right now

Mark Beeghly, a systems analyst at Nutmeg Mills, said putting the company's 55-person sales force on Apple Computer, Inc. laptops saved the company money on paperwork, long-distance calls and copying costs and drastically reduced overnight mail charges. He was unable to provide a figure but said it was significant. But it was the type of information sent to the sales force that made the difference, he said.

"We used to FedEx them their account figures and commissions," Beeghly said. "Now we send it out via computer, and they check it every day. We are able to give them real information on inventory and shipping to real time, so they don't waste time placing orders for things we don't have in stock. It has boosted morale."

Providing quick access to such vital information made it easy to persuade the sales force to rely heavily on their mobile computers, Beeghly said.

This is the kind of information needed to encourage a sales force, often full of highly competitive types accustomed to functioning as lone wolves, to act more as a team, observers said.

Nutmeg Mills' system, equipped with a color monitor perfect for showing customers logos and other illustrations, also helps sales people share information more easily while they are on the road. Sharing market information so quickly has made selling more efficient and productive, Beeghly said.

Ken Dulaney, an analyst at Gartner Group, Inc. in Santa Clara, Calif., said a study conducted by his company came

Automation, *page 52*

Auspex Systems, Inc. has introduced the NS7000/100 NetServer, a Unix Network File System (NFS) server for localized workgroups.

According to the Santa Clara, Calif., company, the data server is based on a multiprocessing architecture that distributes the NFS workload to multiple processors dedicated to network, file, storage and Unix system processes.

The NS7000/100 NetServer comprises two scalable models supporting from 15 to 50 users and from 8G to 90G bytes of disk storage.

The base configuration of the NS7000/100 NetServer costs $59,950.

▶ *Auspex Systems*
(408) 986-2000

KOM, Inc. has introduced OptiServer for Microsoft Corp.'s Windows NT, a software interface that supports a mix of optical drive sizes.

According to the Kanata, Ontario, company, OptiServer for Windows NT features dedicated magnetic caching for quick access to large volumes of data stored on optical storage peripherals. Its read caching reduces jukebox media swapping, and its write caching delays writes to media until all read requests have been processed.

OptiServer for Windows NT is an attached device driver and supports multiple SCSI devices and host adapters.

Pricing for OptiServer for Windows NT begins at $1,500.

▶ *KOM*
(613) 599-7205

Maximum Computer Technologies, Inc. has announced DoubleVision for Character Terminals 2.0, remote control software for Unix systems.

According to the Kennesaw, Ga., company, the product lets a remote system connect to a host terminal and have full access to its screen and keyboard on a Unix system. Once attached, the remote keyboard operates the host terminal over a serial I/O board, modem or network. The remote access can be used in collaborative computing, network management activities, technical support, training and product demonstrations.

The product includes features for screen tracking, screen reviewing and activity logging. It lets multiple users view the same terminal simultaneously and is designed to work between disparate and proprietary terminals. Its mapping capability adapts to different terminal environments and reformats terminal screens.

DoubleVision for Character Terminals 2.0 costs $395 per machine.

▶ *Maximum Computer Technologies*
(404) 428-5000

Crystal Computer Services, Inc. has introduced Crystal Info, a decision-support product for data access and analysis and information delivery.

According to the Vancouver, British Columbia, company, Crystal Info comprises an Information Desktop, Information Library and Information Management System.

The Information Desktop lets users browse through a catalog of reports and queries and then delivers requested information to specific people at designated times. The Information Library simplifies data access, lets users design ad hoc queries and reports and supports several user groups. The Information Management System lets systems administrators process data, manage data access and manage user profiles.

Crystal Info's open architecture is designed to work over a LAN, WAN or via modem.

Pricing for Crystal Info starts at $350 per seat.

▶ *Crystal Computer Services*
(604) 693-6301

Get the router that pays for itself

You just can't afford an ordinary router

Our new NetRunner® Integration Router not only routes IP and IPX traffic, it also carries your remote legacy data, fax and phone calls free of charge! You'll save hundreds, even thousands a month in communication costs.

yes NetWare tested and Approved

Here's how our router saves you thousands

Ordinary routers can connect your remote LANs and some even offer legacy data integration for an additional charge. But your phone and fax communications remain separate—and costly. NetRunner multiprotocol I-Routers send it all for free over a single connection, saving you money every time the network is used. Legacy data, phone and fax charges are completely eliminated.

Save Again.

We've designed the NetRunner Integration Router for hassle-free remote LAN administration, saving you even more money. All NetRunners feature EasyRouter technology which automatically handles all remote LAN user relocations. Even better, EasyRouter technology eliminates the need to build routing tables and set gateway configurations. And, the NetRunner with EasyRouter technology is fully compatible with other vendors' routers.

Call (800) MICOM U.S. [642-6687], extension 1034 or (805) 583-8600, extension 1034 to start your savings. Ask for a live demonstration of voice with LAN/WAN and a schedule of our free nationwide Voice LAN/WAN Integration seminars. Fax (800) 343-0329.

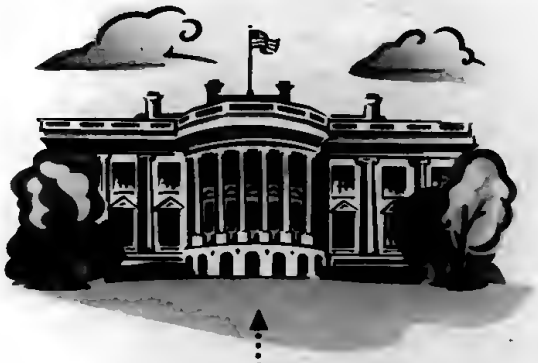
Look into NetRunner today, because your company just can't afford ordinary routers.

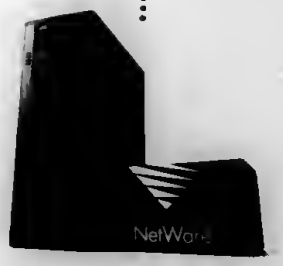
NetRunner. The Router That Pays for Itself.

MICOM®
Products That Pay for Themselves™

SAVE
MONEY RECRUITING STAFF
ADVERTISE IN COMPUTERWORLD'S REGIONAL CAREERS PAGES. THEY WORK.
1-800-343-6474, x201
Call for our free Guide to IS Recruiting Tools!

IT GETS EVERYONE WORKING TOGETHER, LEFT AND RIGHT.





MANHATTAN SERVER PRE-LOADED WITH NOVELL NETWARE 4.1,
Intel 90MHz processor, SMP ready to MP 1.1 spec., PCI/EISA bus.
Hot swap disks and ECC memory on P-series models.

Our award-winning Manhattan™ servers were voted among the best. Now they're even better. Both the P- and V-series Manhattan servers are now loaded and pre-configured with Novell Netware® 4.1. With new ease-of-use features, you'll be able to get your whole network up and running quicker. (No gridlock here.) And that's not the only software we've pre-loaded. *Percepta*™ combined with *Wanderlink* provides local and remote network management capabilities. To help protect your system, there's *Cheyenne* anti-virus software.

What about service? Should you ever require it, we're fully prepared to respond to your workplace. With our Guardian Care® program, we can be there within just four hours.

For information about AST servers, please call 1-800-876-4AST. Then at least your own corner of the world will start running smoothly.

AST. COMPUTER

© 1995 AST Research, Inc. All rights reserved. AST is a registered trademark of AST Research, Inc. AST Computer, the AST logo, Manhattan and Percepta are trademarks of AST Research, Inc. [illegible] AST Research, Inc. Netware is a registered trademark of Novell, Inc. Intel and Intel Inside logo are registered trademarks of Intel Corporation. All product or service names mentioned herein may be trademarks [illegible]

Multipurpose servers take a backseat

Survey shows dedicated servers taking over backup task

By Steve Moore

Installing a dedicated server to handle data backups paid off handsomely in administrative cost savings for Lawrence Berkeley Laboratory, a U.S. Department of Energy research facility in Berkeley, Calif. The laboratory also uses dedicated servers for electronic mail, group scheduling and Oracle Corp. databases, but "the backup server was the one that paid off the fastest," said network administrator Roberto Morelli.

Start-up costs of about $45,000 for a fault-tolerant Novell, Inc. NetWare server, Cheyenne Software, Inc. Arcserve backup software and tape drives were recovered within a year, he said. The savings came primarily from improved staff productivity. Productivity had suffered when multipurpose servers handling backups went down and data could not be restored quickly, Morelli explained.

The laboratory's backup server reliably handles 20G bytes of data every night across "all of our Macintosh servers, Novell servers, a few PC clients and all of our Unix machines," even though it "runs 100% loaded 12 hours a day," Morelli said. Another server is still multipurpose.

Step aside

By 1997, dedicated backup servers will replace the multipurpose servers used today at many sites, according to a recent survey (see chart). "File servers are getting loaded with more activities, so it makes sense to push backup to a dedicated server," said Michael Peterson, president of Strategic Research Corp. in Santa Barbara, Calif., the consultancy that released the survey.

But while backups handled by dedicated servers are inherently more reliable than those performed on multipurpose servers, users are well advised to invest in multiple dedicated servers because "one of anything will fail," Peterson said.

A safe rule of thumb to follow in large distributed computing environments is to have one backup server for every three to five file servers, he said. The use of multiple backup servers also helps prevent networks from bogging down, he added.

How servers are backed up

	Workstation[1]	Server[2]	Backup server[3]	Non-application[4]
1992	80%	5%	0%	15%
1994	20%	65%	5%	10%
1997*	10%	32%	50%	8%

*Projected

Base: 1,200 user sites surveyed on backup configuration

[1]Backup runs on client workstations
[2]Backup runs on a multipurpose file server
[3]Backup runs on a single dedicated backup server
[4]Not using backup applications; backups handled via Unix commands and scripts

Source: Strategic Research Corp., Santa Barbara, Calif.

No central location

One company found a way to use a multipurpose backup server, not a dedicated one, and still kept its network clear. With nearly 50 servers to back up, many holding 80G bytes of data apiece, "It would be a major nightmare if I had all my data coming across the wire to a central location," said Larry Lemay, a network engineer at Computer Language Research (CLR), a corporate tax processing firm in Dallas.

CLR's solution was to use backup software from Palindrome Corp. in Naperville, Ill., and a dedicated 8mm or digital linear tape unit on each server. With Palindrome's incremental backup technology, "the volume of data we're backing up at any given time is not enough to flood the network," he said. "We're using a nondedicated server to back up multiple servers and are not having any problems whatsoever."

Still, Peterson advised, dedicated backup servers make sense for small to midsize organizations seeking to "consolidate data from lots of servers and workstations across multiple platforms." They also narrow the "window of risk" by doing backups more frequently, he said.

Automation

CONTINUED FROM PAGE 49

up with similar findings.

"We found that simply automating a sales force was a pretty dismal failure," Dulaney said. "You have to make the sales force feel like a business partner. By giving them information like their commission figures, you can begin to get them in the process of team selling."

Re-engineering a corporate culture to encourage teamwork can take time and cost money, Greene said. Companies should use technology such as groupware, which allows workers to share data easily between far-flung locations and time zones and facilitates workflow.

And finally, he said, using technology to complete sales tasks more tightly integrates the customer into the company through the salesperson, who has become more than just an order-taker. It is worth the trouble, Greene said.

A variety of wireless choices exist for a range of tasks

Standard	Vendors	Advantage	Suggested applications
Infrared	Hewlett-Packard, IBM	Easy and fast way to transfer data between computing devices	Portable-to-desktop data synchronization
Radio	RAM Mobile Data, ARDIS	Inexpensive (compared with cellular) for short messages	E-mail updates for notification of schedule and meeting changes
Cellular Digital Packet Data	McCaw Cellular, Bell Atlantic	Easy and fast way to transmit data over cellular lines	Transmission of updated sales call reports
Personal communications services	AT&T, Sprint	High-bandwidth network built from ground up for two-way wireless communications	To be determined

Source: Summit Strategies, Inc., Boston

Chargeback

CONTINUED FROM PAGE 49

when it comes to chargeback. Khalifa Jallad, an information systems manager at the Maryland Office of Planning in Baltimore, said chargeback is a way to manage other state agencies' network access to the large number of data files his office maintains.

"Runtime applications are no big deal," Jallad said. "But with the data, as more people get connected in the state, [chargeback] will make a major difference."

On the metering side, Jallad said he now purchases software licenses for only half the number of users on the LAN; then he follows the usage patterns to see whether more licenses are really needed.

LANrecord can be integrated with Horizons' LANauditor inventory software so that all network information gathered by LANauditor is immediately available when LANrecord is started. This saves configuration time for the administrator, according to Richard Brownrigg, senior product manager at Horizons.

Like products from competitors On Technology, Inc., Symantec Corp. and McAfee Associates, Inc., LANrecord cannot meter licenses for PC-resident applications. According to Villars, this is normal for the industry and has to do with the configuration of desktop systems. "Most of the time, server-based monitoring is satisfactory," he said.

MEDICAL ALERT...
Heartburn Traced to
Unix "vi" Editor

Don't let a cryptic editor give you indigestion! Trade in the Maalox for Unix tools you learned on the mainframe.

uni-SPF ispf-style Editor, Browse, Utilities, ... even Dialog Mgmt!

uni-XEDIT cms-style Editor with Full Macro Support

uni-REXX Portable System Control and Macro Language

wrk/grp
The Workstation Group

800-228-0255
sales@wrkgrp.com
http://www.wrkgrp.com

Announcing
the

Apple Enterprise Awards

Finalists

This June, Apple Computer, *Computerworld* and MacIS will pay tribute to nine of the world's best enterprise software developers at the first annual Apple Enterprise Awards.™ Their innovative work has empowered individuals within corporations and institutions to accomplish more than ever before. So much more that we decided to honor them with an awards show of their very own. And after receiving submissions from around the globe, we're now proud to announce our twenty-seven finalists.

- Communication and Collaboration (Business, Education and Government):
  - Bergen Brunswig Corporation, *AccuSource*
  - Pacific Northwest Laboratory, *TWEAT, Ternary Waste Envelope Assessment Tool*
  - Trilogy, *Conquer's Data Capture (The Industry Standard Computer Information System)*
- Cross-Platform (Business, Education and Government):
  - The Naval Air Systems Command (Information Management Department), *Naval Aviation Wide Area Network (NAWAN)*
  - The Prudential Insurance Company of America, *The Member Services System (MSS), Version 4.50*
  - Walt Disney Pictures, *DISNEY "RADAR"*
- Departmental/Workgroup Client/Server:
  - Alex, Brown & Sons Incorporated, *Alex, Brown Trading System (ABS Trading System)*
  - Lockheed Missiles & Space Co., Inc., *1515 Machine 2.0.1*
  - Northwest Airlines, Inc., *Aircraft Situation Display*
- Education/Government Client/Server:
  - San Joaquin Delta College, *System 2000*
  - University College Dublin, *WEST (Web Educational Support Tools) 1.0*
  - University of Texas at Austin, *UTX Image View Client and UTX NW Image Server 1.0*
- Enterprise Client/Server:
  - Control Data Systems, Inc., *Control Data Advisor*
  - Dartmouth-Hitchcock Medical Center, *MacCIS*
  - Northrop Grumman Corporation, *Integrated Graphics Communication System (IGCS) 2.016*
- Mobile Computing (Business, Education and Government):
  - Centric Systems Corporation, *The Mortgage Market*
  - Medical Support Services, Inc., *ClinTrak 1.0*
  - Zimmer, Inc., *Zimmer Information Console (ZIC) Associate Tool 1.1.1*
- Multimedia Kiosk (Business):
  - Andersen Windows, Inc., *The Andersen Window of Knowledge™ System*
  - Booz Allen & Hamilton Inc., *Knowledge On-Line Kiosk 1.0*
  - MacTraining, *LinkIt™ 2.1*
- Multimedia Kiosk (Education and Government):
  - City of Longview, Washington, USA, *Get in Touch*
  - Honoka'a High School, *"Instant Interactive" 1.0*
  - Penn State University, *Penn State Alumni Association Information Kiosk 1.0*
- Publishing (Business, Education and Government):
  - Second Look Computing of the University of Iowa, *Arachnid 1.0*
  - United States Surgical Corporation, *Suture Label Approval Software (SLAS)*
  - University of Pennsylvania, *Penn Printout Online*

Winners will be announced at a ceremony during the PC EXPO in New York, June 20-22, 1995. Winning applications will be announced by Michael Spindler, Apple's president and CEO, and showcased in a special supplement in *Computerworld*.

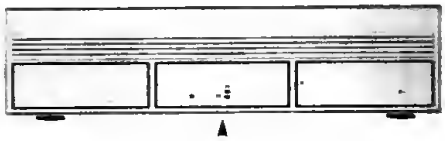
Please help us honor some of the best software developers in the world and call 1-800-396-6877 to get your complimentary tickets to the awards show, or come see the Apple Enterprise Awards booth. And join us here in the Big Apple.

Apple Enterprise Awards

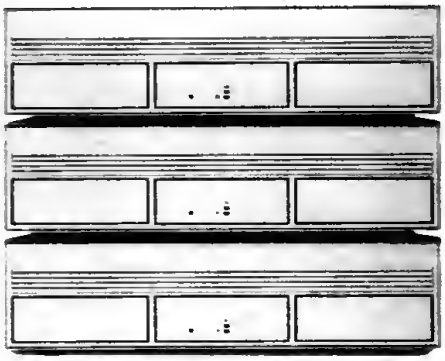
Computerworld's Corporate Application Contest

© 1995 Apple Computer, Inc. All rights reserved. Apple and the Apple logo are registered trademarks of Apple Computer, Inc. Apple Enterprise Awards is a service mark of Apple Computer, Inc. Computerworld, Inc. is an IDG company. MacIS is a registered trademark of Managing Office Information Systems. All company names and product titles are trademarks of their respective companies.

THERE'S NEVER BEEN A ROUTER LIKE IT.



NO WONDER WE'RE SELLING STACKS OF THEM.



INTRODUCING THE ACCESS STACK NODE, THE FIRST STACKABLE ROUTER.

Okay, so it doesn't look like a coutec. But trust us, it is. And there's not another one like it. That's because the Access Stack Node™ from Bay Netwocks is the only couter that lets you pay as you grow — up to 32 netwock intecfaces with up to 200,000 pps forwarding performance. Although you can stack up to fouc, they manage as a single router. (Credit that to a unique multipcocessoc architectuce.) And you can also unstack and redeploy them as needed. It's one more way Bay Netwocks gives you moce choices foc your netwock. So call 1-800-8-BAYNET to learn more. The Access Stack Node. It's got the potential to be very big.

New laws sought for info warfare

As technology outpaces the law, military experts debate the definition of an 'act of war' in the information age

By Gary H. Anthes
WASHINGTON

■ "In wartime, truth is so precious that she should always be attended by a bodyguard of lies," Winston Churchill said in 1943.

The term "information warfare" may be new, but its importance was well understood 50 years ago, when Allied commanders manipulated the truth to the ultimate devastation of German forces during and after D-Day.

But despite a long understanding of the role of knowledge in warfare, the military "doctrine" that guides our armed forces is woefully outdated for the information age.

Sneak attack

"Our whole defense doctrine has been based on the assumption that the enemy does not come into the U.S.; we have not had an invasion since 1812," said Paul A. Strassmann, visiting professor of information warfare at the National Defense University (NDU) here. "But now, any two-bit dictator can invade us electronically and do great damage with virtual impunity."

Not only is the U.S. ill-prepared for such attacks, but it also lacks the legal and policy framework for dealing with them, Strassmann said.

Although each of the military services is updating its military doctrine, information warfare raises hard questions, legal and military experts say. For example, in an electronic environment, when does war begin? How does one measure damage and define victory? Does a malicious probe of a U.S. computer system warrant a quid pro quo response or a traditional combat response? Who decides to deploy offensive information weapons? Would a systems attack by the U.S. require congressional approval?

"If someone brings down the Federal Reserve System electronically, is that an act of war?" Strassmann asked. "There would be a great deal of debate about that."

"The area is so new. What is an act of war in the information age? Nowhere is that defined," agreed military historian Daniel T. Kuehl, a professor at the School of Information Warfare and Strategy at NDU. "Has the technology outpaced existing laws? Of course."

The U.S. Air Force is finding its move to a new doctrine a difficult one, said Gen. Ronald R. Fogelman, Air Force chief of staff. "Because exploiting [information systems] will readily cross international borders, we must be cognizant of what the law allows and will not allow," he said. "We must have good legal advice as we get into this."

Enemy territory

Information warfare consists of actions taken to:

- Gain and use information about the enemy.

- Deny, corrupt or destroy the enemy's data.

- Protect U.S. data and systems.

– Gen. Ronald R. Fogelman, U.S. Air Force chief of staff

Legal limits

U.S. defense and intelligence agencies operate under a legal framework that makes it difficult to mount a coordinated response to an information warfare attack. The U.S. Department of Defense is critically dependent on civilian telephone and air traffic control systems, for example, yet it is prevented from intervening in civilian matters.

Similarly, the Central Intelligence Agency may deal only with matters outside the U.S., while the Federal Bureau of Investigation is limited to internal affairs.

Air Force Gen. Ronald R. Fogelman: *'We must have good legal advice as we get into this'*

Strassmann said he supports legislation recently sponsored by Sen. William Cohen (R-Maine) that would establish the position of chief information officer of the U.S., and he is lobbying to have Cohen's bill specify "information security" as a key part of the CIO's responsibility.

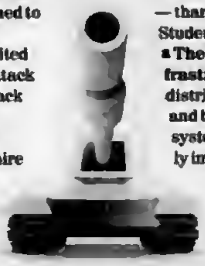
"We need a comprehensive legal framework to protect information systems," said Adm. William O. Studeman, deputy director of the CIA, in a recent speech. "[We need] hacker prosecution laws, [a] better definition of computer crime and an examination of the legal basis for [an] appropriate government role in protecting information systems."

Information under siege

Military expert Paul A. Strassmann said, "The United States has been under attack since last June." He declined to elaborate.

"To attack the United States, you do not attack its airfields; you attack its information systems," Strassmann said. "And you just hire the criminal element to do it for you. It only takes four to six guys, such as ex-KGB agents."

Deputy Director of the CIA William O. Studeman said targets could include the following:



- **The morale and psyche of the U.S. public:** "Subversion or denial of service might be more effective — and cheaper — than destruction," Studeman said.
- **The information infrastructure:** power distribution, telephone and banking systems; systems of strategically important companies; and high-tech databases.

"Massive networking makes the U.S. the world's most vulnerable target for information warfare," Studeman said.

— Gary H. Anthes

This free booklet tells what AFP can do for you.

Users of AFP (Advanced Function Presentation) know how powerful a tool this host-centered architecture can be for managing critical business documents. The challenge is: finding the best ways to distribute AFP to your branch offices or other remote sites.

Our free AFP guide can help you sort it out. You'll learn:

- How AFP and IPDS (Intelligent Printer Data Stream) work
- How to use client/server systems to distribute AFP documents throughout your organization
- How to print and view AFP documents on distributed LANs
- How to manage and optimize AFP resources

To get your free guide, call **800/544-4072**, *or write to us at:*

Interface Systems, Inc.
5855 Interface Drive
Ann Arbor, Michigan 48103
Fax: 313/769-1047.

INTERFACE SYSTEMS, INC

AVAILABLE WORLDWIDE
In Europe, call Interface Systems International in Slough, England at +44 (0) 1753 811888 fax +44 (0) 1753 811660

Unix-based software package connects E-mail systems

By Suruchi Mohan

■ Isocor in Santa Monica, Calif., recently announced client/server, Unix-based software that connects disparate mail systems and provides access to the Internet.

The software is called the Scalable Isoplex Message Server 1.0. Like all switching devices that translate messages from one system to another, Isoplex supports a number of systems, including IBM's Profs and Digital Equipment Corp.'s All-In-1. These systems, however, are not supported natively; they require a gateway to connect to Isoplex. Eventually, the company plans to support Profs natively, but it does not plan that support for All-In-1.

E MAIL

Isocor is also working with AT&T Corp. to provide an X.500 connection, enabling administrators to use Isoplex as a central directory for all their mail systems.

"It will be a super switch for translation and routing," said Jim Boswell, president of One Communications Corp., a consulting firm in Pleasanton, Calif. He added that the software will be significant only for large enterprises and organizations that handle large volumes of messages at high speeds, such as the regional Bell operating companies.

Faster than a speeding message

David Knight, vice president of marketing at Isocor, touts speed as the biggest selling point, claiming that Isoplex can handle 743 messages, up to 1K byte in length, per second.

Not only is speed important, but the size of messages is also a key factor. With the ever-increasing popularity of electronic mail, users are sending larger attachments. These attachments can clog the slower links that connect the different messaging servers. Isocor's offering allows administrators to connect all their messaging servers to Isoplex, which speeds up message delivery.

Additionally, if an application is compliant with Microsoft Corp.'s Messaging Application Programming Interface, it can talk directly to Isoplex instead of going through the local server. This is analogous to dialing a person's direct telephone line rather than being patched through a central switchboard.

Isoplex was designed for multiprocessing machines. In its initial release, it will work with Sequent Computer Systems, Inc.'s SMP Symmetry 5000/SE20, symmetrical multiprocessing machines with six Intel Corp. Pentium chips. The company plans to port Isoplex to Hewlett-Packard Co.'s HP-UX and Microsoft's Windows NT later this year.

But at an average cost of $250,000, the entry point for the product is high. Hardware costs are an additional $440,000.

Jim Brandenburg, owner of Messaging Concepts, a value-added reseller in Houston, agreed that the cost of entry is very high. Brandenburg said he plans to implement the Isoplex software on AT&T machines to see if he can get the same performance as the software running on Sequent.

Isoplex will be available in the third quarter.

Stackable hubs

Xyplex beefs up data security

By Laura DiDio

Xyplex, Inc., a Raytheon company, has enhanced its 3100 family of stackable hubs with data security features that allow network administrators to restrict access and lock out would-be intruders.

The latest Access Security and Eavesdrop Security features for the 3100 stackable hubs provide businesses with scalability across networks with as few as 16 ports to large networks with as many as 336 ports, said Erv Johnson, media and switching product manager at the Littleton, Mass.-based company.

The Access Security feature lets network managers restrict port connections to individual network devices based on physical Ethernet media access control addresses.

Family affair

The Xyplex 3100 family of Simple Network Management Protocol-managed, 10Base-T stackable hubs has been shipping since the fourth quarter of 1993. The 3130 model is equipped with 16 ports and costs $1,990. The 3140 model has 24 ports and lists for $2,390.

This capability effectively locks out unauthorized users by comparing the incoming source address to a predefined address with security clearance, Johnson said. "If the two Ethernet addresses don't match, the port is automatically disabled, and the intruder is denied access," Johnson said.

The Eavesdrop Security feature ensures data protection by allowing data to be transmitted only to authorized destinations addresses and users on the LAN, Johnson said.

Networks without eavesdropping protection are vulnerable to unauthorized sniffers or listening devices that can attach to any available port, Johnson explained.

The Xyplex 3100 family of stackable hubs that is equipped with the new security features is shipping now.

2+ years experience in SAP?

> *Why do some companies put you in the fast lane, and then expect you to walk?*

Einstein said "God is in the details." And who are we to argue? We think a look at our benefits package is a glimpse into the very essence of our company itself. We consult on business reengineering to keep our clients healthier. We provide fully-paid medical and dental coverage to our employees for the same reason. The SAP systems we implement help clients prepare for the future. Our employee 401(k) plan serves a similar purpose. And if our FastTrack 4SAP methodology is a proven vehicle for getting our clients from point A to point B a lot faster than the next guy, shouldn't we be doing the same for our employees? Welcome to ICS Deloitte. Enjoy your company car.

ICS Deloitte

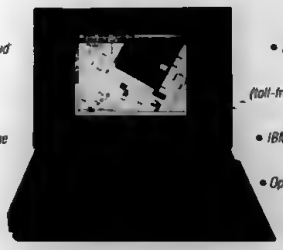
Fax your resume to 1.610 558 7296
Mail your resume to H.R. Manager, ICS Deloitte, Brandywine 5, Chadds Ford, PA 19317
An equal opportunity employer

"I'm highly mobile. I need service and support wherever my business takes me."

IBM Solution #90768-F **a.k.a. "Courier Repair"**

Let's say you're out in the middle of nowhere and your notebook suddenly crashes. Two options. You could (a) break out in a cold sweat. Or (b) calmly place a toll-free call to receive ThinkPad EasyServ.™ No matter when you call, we'll come and retrieve your ThinkPad®, fix the problem and speed it back to you, usually within 48 hours. All without costing you one cent. See? There is intelligent life out there. ThinkPad EasyServ. One more reason there is a difference.™

- *Prearranged and prepaid[1] two-way shipment*
- *2-business-day average repair cycle[2]*
- *Part of IBM HelpWare®*



- *IBM PC Support line (toll-free problem analysis)*
- *IBM mobile technicians*
- *Optional 24-hour repair service for $99.00[1]*

FOR DETAILS ON THINKPADS, CALL 1 800 772-2227*

IBM

*Available in the U.S., Canada and Mexico. [1]Return is two days from the time it leaves your location. No additional cost during warranty period only. [2]Retrieval in continental U.S. only. IBM, ThinkPad and HelpWare are registered trademarks and ThinkPad EasyServ and "There is a difference." are trademarks of International Business Machines Corporation. *In Canada, call 1 800 465-7999. © 1995 IBM Corporation.

Unix/Web server combo debuts

By Neal Weinberg

Linux, the Unix-like darling of students and World-Wide Web surfers, takes a major step toward respectability this week when Caldera, Inc. ships its first product.

The Orem, Utah-based start-up, backed by former Novell, Inc. Chief Executive Officer Ray Noorda, has started taking orders for the preview version of Caldera Network Desktop for Internet Access.

The product bundles the Linux freeware operating system with other features to provide a commercial-strength Web server.

Mark Bolzern, an analyst and president of WorkGroup Solutions, Inc. in Aurora, Calif., said Caldera will bring Linux to a new group of users by providing a graphical desktop interface. "It's an ease-of-use issue," he said.

He added that most of the commercial implementations of Linux are based on Internet access, which is appropriate because Linux was developed on the Internet by volunteers.

Caldera's product "sounds pretty good," said Stephanie Gilgut, co-principal at Wiz Vax Communications in Troy, N.Y. Her company uses Linux to run an Internet access provider that has more than 200 users.

Gilgut said Linux has multiuser, multitasking capabilities that allow hundreds of users to reach the Internet through one PC.

According to Bolzern, hundreds of companies that provide Internet access for a monthly fee are springing up across the country.

What's it got?

Caldera Network Desktop

- Linux operating system
- Full-featured GUI
- Built-in networking for the Internet
- Full-featured Novell NetWare client
- 32-bit Windows API
- Price: $29 plus $10 shipping and handling

Linux, but better

Brian Rice, a member of the technical staff at K Computing, Inc. in Raleigh, N.C., which markets computer training, says Linux has been "our point of contact on the Internet." Rice said the basic Linux operating system has been "pretty bulletproof," and with Caldera, users get "a nice GUI to sit on top of it."

As Caldera refines and adds features to the software, "that's going to be ultimately an interesting product," Rice said.

Mark Komarinski, a writer for "The Linux Journal," said Caldera "shows a lot of potential." He said "one of the things lacking so far has been the real backing of a company that people can call for technical support."

He said smaller companies provide many of the features that Caldera offers, but none have the Noorda name behind them.

A number of scattered companies market Linux on CD-ROM or sell complete hardware/software packages, but Caldera offers to become the central repository for Linux-based technical support.

The preview release of Caldera Network Desktop for Internet will be followed by a more complete version this fall, said Ransom Love, vice president of marketing at Caldera.

On-line pay per view

Helping IS stay above the copyright law

By Mitch Betts

The hot trend in "business intelligence" is to glean news reports from on-line services and the Internet, then compile them in an electronic newsletter distributed on the corporate network to dozens of managers and employees.

In a recent *Computerworld* ethics survey of 255 information systems professionals, 72% of respondents said they should be able to download on-line news articles and share them with as many people as they want.

The only problem is that, well, that's illegal.

Although the law is not crystal clear, copyright experts generally say that downloading an article for personal research is "fair use," but distributing copies to dozens of colleagues is not.

"The technical ability to make copies is a little ahead of the administrative tools to enable honest people to do it right," said Barry Weiss, a partner at the law firm Gordon & Glickson in Chicago. One problem is the hassle factor of tracking down the copyright holders for payment.

The good news is that some technical solutions are emerging:

- The pioneer is Knight-Ridder Information, Inc.'s Dialog information service in Mountain View, Calif., which has a copyright-compliance service called Dialog ERA. Users enter a command stating how many copies they want to redistribute or archive and are billed on a sliding scale. Dialog forwards the royalties to the participating content providers.
- The Copyright Clearinghouse Center (CCC) in Danvers, Mass., and Electronic Publishing Resources, Inc. (EPR) in Sunnyvale, Calif., have teamed up to address the copyright problem in so-called "information commerce." CCC will act as a digital rights clearinghouse, while EPR will provide software that encrypts the information in an electronic envelope called the DigiBox. Users get free software that unlocks the DigiBox and allows them to view the information.
- The Intellectual Property Licensing Agency, Inc. in North Little Rock, Ark., last month claimed it will be "the Internet's first copyright protection agency" when it begins beta-testing this month. Authors register their works with the agency and get royalties each time the works are viewed, or Internet service providers can get a blanket license and bill users.

Fifty-six percent of the IS professionals surveyed by *Computerworld* said they would pay for on-line articles if a royalty scheme were available.

Videoconferencing utility hits the big time

White Pine to market CU-SeeMe software

By Ellis Booker

From his Macintosh in New York, a Cornell University graduate student talks with a friend in Atlanta, who repositions his monitor-mounted video camera to show the traffic along 13th Street.

Both locations are using CU-SeeMe, a software-based videoconferencing utility developed at Cornell University in 1993 and freely available on the Internet. Last month, Cornell announced an exclusive master licensing agreement with White Pine Software, Inc., which will create a low-cost, commercialized version of the technology.

White Pine officials say their commercial product, available later this year at a starting price of $99, will include enhancements such as color, improved audio fidelity, interactive whiteboard and application sharing. White Pine also plans to release application programming interfaces for developers.

Strategic alliance

AT&T and Apple late last month announced plans to add Apple's QuickTime videoconferencing technology and desktop collaboration tools to AT&T's WorldWorx Network Services. The alliance means QuickTime users will be able to connect to non-Apple systems. Apple expects to ship its first QuickTime systems in the third quarter.

CU-SeeMe supports both point-to-point "video phone" calls and multiparty videoconferencing using a common server component.

"We expect users to demand commercial-quality software as they did with Eudora E-mail and the Mosaic Web browser," said White Pine President Howard Berke.

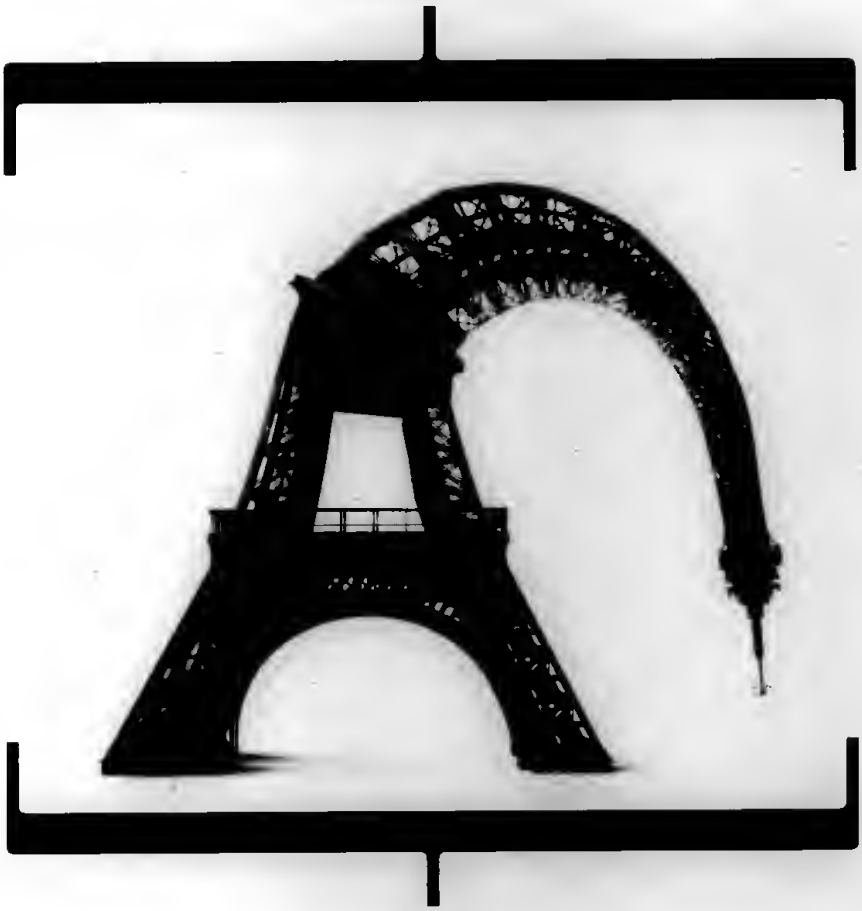
Videoconferencing analysts said the commercial version of CU-SeeMe will face plenty of competition from established desktop videoconferencing products from the likes of Intel Corp., AT&T Corp. and Apple Computer, Inc. These packaged products, which do not work across TCP/IP networks and require dedicated or virtual switched networks such as Integrated Services Digital Network, are priced from $1,500 to $2,500.

"CU-SeeMe has an opportunity for [supporting] ad hoc teams," said Christine Perey, an independent consultant and writer specializing in multimedia applications. Using the Internet to transport video, Perey noted, is cheaper than dedicated links; the trade-off is there are no guarantees about the level of service for picture quality. Another downside of video systems such as CU-SeeMe is that they are not part of the ITU H.320 protocols for networked videoconferencing.

CU-SeeMe *will include enhancements such as color and improved audio fidelity*

Elliot Gould, president of TeleSpan Publishing Corp. in Altadena, Calif., which tracks the conferencing market, agrees that the nonsupport of H.320 and the crude image quality will cause most corporate customers to look elsewhere.

"The last thing I need is a computer that can't adapt itself to the future."



IBM Solution # 81061-R **a.k.a. "Flexible Architecture"**

No company on earth can afford to turn its back on emerging technology. Which helps explain why IBM PCs and their SelectaBus™ architecture are so convenient. Credit our unique riser cards that offer you complete freedom to choose your desired expansion bus. Which means you can take advantage of higher-performance alternatives while saving thousands in upgrade costs. As they say in some parts of the world: "très magnifique!" SelectaBus. One more reason there is a difference™

PC 300

- *SelectaBus ISA/VESA or ISA/PCI*[1]
- *Three-year warranty*[2]

PC 700

- *SelectaBus PCI/ISA or PCI/MC*
- *IBM HelpWare®*
- *Easy Tools*
- *Fax ID# 1776*

FOR DETAILS ON IBM PCs, CALL 1 800 772-2227[3]

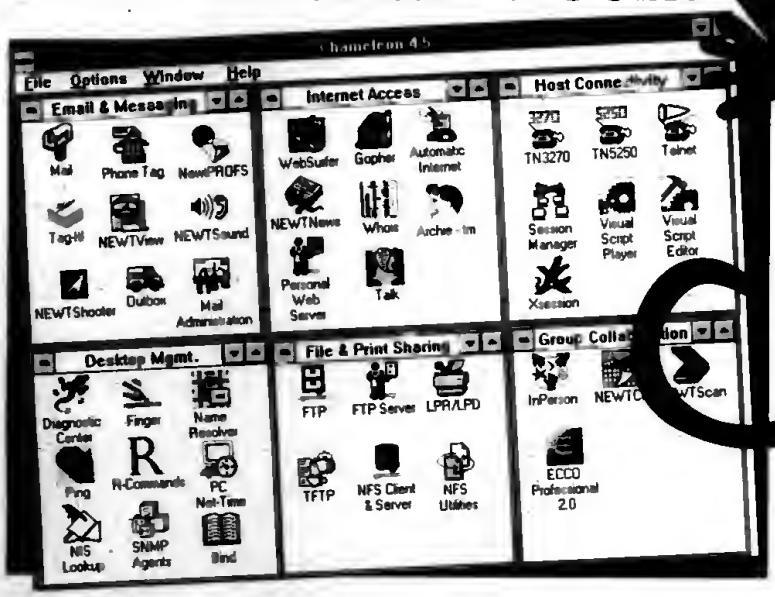
IBM

[1]Available only on 486 models [2]For copies of IBM's Statement of Limited Warranty, call 1 800 772 2227. Monitor stand optional. Product availability may vary. IBM and HelpWare are registered trademarks and SelectaBus and "There is a difference" are trademarks of International Business Machines Corporation. [3]In Canada call 1 800 465 7999. ©1995 IBM Corporation

TCP/IP Applications For Windows.

Network Your Desktop To The World With **Chameleon.**

New Version! 4.5



BEST VALUE.

Chameleon is a TCP/IP Windows desktop that offers more applications than any other product. It provides you with a comprehensive Windows solution for TCP/IP networking.

SIX INTEGRATED SOLUTION SUITES.

Chameleon desktop applications are integrated for powerful cross-functional capabilities. Drag-and-drop any information on the network between applications at the click of a button.

SEAMLESS ACCESS TO CORPORATE INFORMATION RESOURCES.

Chameleon includes more applications that allow you to access information on Unix, mainframes, minicomputers, PC-based LANs and WANs, and the Internet.

OFFICE, HOME, AND REMOTE NETWORK ACCESS.

Connect to your network and the Internet via LAN or dialup access with one easy-to-use software package. Send and retrieve email, download files, print documents, login to remote hosts, and run client/server applications. Connect your PC to the world with Chameleon.

NetManage Chameleon includes WinSock TCP/IP and is 100% DLL/VXD. Chameleon requires only 6KB memory and configures in just 5 minutes.

OVER 40 FULLY INTEGRATED APPLICATIONS INCLUDED:

- Host Access
  - Telnet: VT100, VT220, VT320, TVI, Wyse, TN3270, TN5250, Visual Script Editor & Player, X Windows*
- File & Printer Sharing
  - NFS Client & Server*
  - FTP Client & Server
  - LPR/LPD
- Electronic Mail & Messaging
  - SMTP Mail with MIME
  - IBM PROFS
  - Phone Tag, Tag It
  - Calendar/Scheduler
- Internet Access
  - WWW Client & Server
  - Gopher
  - Newsreader
  - Archie
  - Whots
- Group Collaboration
  - ECCO Personal & Group Information Management*
  - InPerson Network Whiteboard
- Desktop Management
  - Ping, Finger, Name Resolver
  - DNS Client & Server
  - R-commands
  - PC Net Time
- TCP/IP Communications
  - Winsock
  - 100% DLL TCP/IP Stack
  - LAN: Ethernet, Token Ring
  - Dialup: SLIP, CSLIP, PPP & ISDN
- And More...

*Optional

UPGRADE TO 4.5 FOR ONLY $95!

MICROSOFT® WINDOWS™ COMPATIBLE | yes NetWare Tested and Approved | Sept 1994 | Sept 1994 | Sept. 1994 | Data Comm | WINDOWS MAGAZINE 1995 WIN 100

NETMANAGE™
Network Your Desktop To The World
(408) 973-7171
e-mail: sales@netmanage.com
World Wide Web: www.netmanage.com

© 1995 NetManage Inc. 10725 North De Anza Boulevard Cupertino California 95014 U.S.A. Fax (408) 257-6405 U.K. +44 (0) 1483 302333 Israel +972-4-560234 Germany +49-6165-923 428 France +33-1-47 72 66 09. Specifications are subject to change without notice. All trademarks are property of their respective companies.

I'd [illegible] see this well-rounded [illegible]tal printer in action.

Send me a L5031 Video and Print Samples

NAME

TITLE/FUNCTION

COMPANY

STATE ZIP

PHONE FAX

Currently a Printronix customer? Yes No

Host System(s)

Please have a sales representative contact me.

I'm planning to purchase a printer in: 1-3 mos. 3-6 mos. 6-12 mos.

PRINTRONIX

For quicker response, fax this card to (714) 476-2135 or call us at (800) 665-6210.

CW 95

No Postage
Necessary
If Mailed
In The
United States

BUSINESS REPLY MAIL
First Class Mail Permit No 5746 Irvine CA

Postage Will Be Paid By Addressee

PRINTRONIX
MS C9
P O Box 19559
Irvine CA 92713-9953

Emulex Network Systems Corp. has announced NetQue Pro 2, a print-sharing device featuring three printer/plotter ports.

According to the Costa Mesa, Calif., company, NetQue Pro 2 lets Ethernet network users, running under a variety of operating systems, share the same printers and plotters. It is a stand-alone, external printer server featuring two bidirectional parallel ports and a single high-speed serial port.

NetQue Pro 2 supports network operating systems such as Novell, Inc.'s NetWare and Apple Computer, Inc.'s EtherTalk. It also supports IBM's LAN Server and Microsoft Corp.'s LAN Manager.

NetQue Pro 2 costs $599.

▶ *Emulex Network Systems*
(714) 662-5600

Compatible Systems Corp. has announced the RISC Router 4000S.

According to the Boulder, Colo., company, the RISC Router 4000S combines Ethernet switching speeds with subnetting benefits of multiprotocol routing. It features four Ethernet ports with auto-switching connectors. The ports operate simultaneously at wire speed (14,800 packet/sec.) and let users control and segment their network traffic.

The RISC Router 4000S supports full routing of TCP/IP, IPX, Apple Computer, Inc.'s AppleTalk and Digital Equipment Corp.'s DECnet network protocols. It also provides Spanning Tree bridging for other network protocols.

The RISC Router 4000S costs $3,495.

▶ *Compatible Systems*
(303) 444-9532

Technologic, Inc. has released Interceptor Firewall 1.1, network security software.

According to the Atlanta company, Interceptor Firewall 1.1 provides a single path for data between a corporate network and the global Internet. It allows corporate users to access Internet services and prevents unauthorized outside users from entering the network. The product includes network access control, proxy services and mail forwarding.

Interceptor Firewall 1.1 runs on a dedicated host processor that functions completely as a network safeguard.

Pricing for Interceptor Firewall 1.1 begins at $17,250.

▶ *Technologic*
(404) 843-9111

INVITE
TOP I.S.
STUDENTS
to work for your organization in Computerworld's 1995-96 Campus Edition.
Deadline: Sept 15
1-800-343-6474 x201

Creative Assistance Software has announced CapWatch 1.0, an OS/2 LAN server utility.

According to the Charlotte, N.C., company, CapWatch 1.0 lets administrators track server utilization against network configurations. It provides real-time graphing of the use, logs of the data, graph capture and redisplay and configuration of alarm and alert levels.

CapWatch 1.0 can be operated locally on the server without generating network traffic or remotely across the LAN from any OS/2 workstation.

CapWatch 1.0 costs $129.

▶ *Creative Assistance Software*
(704) 544-0001

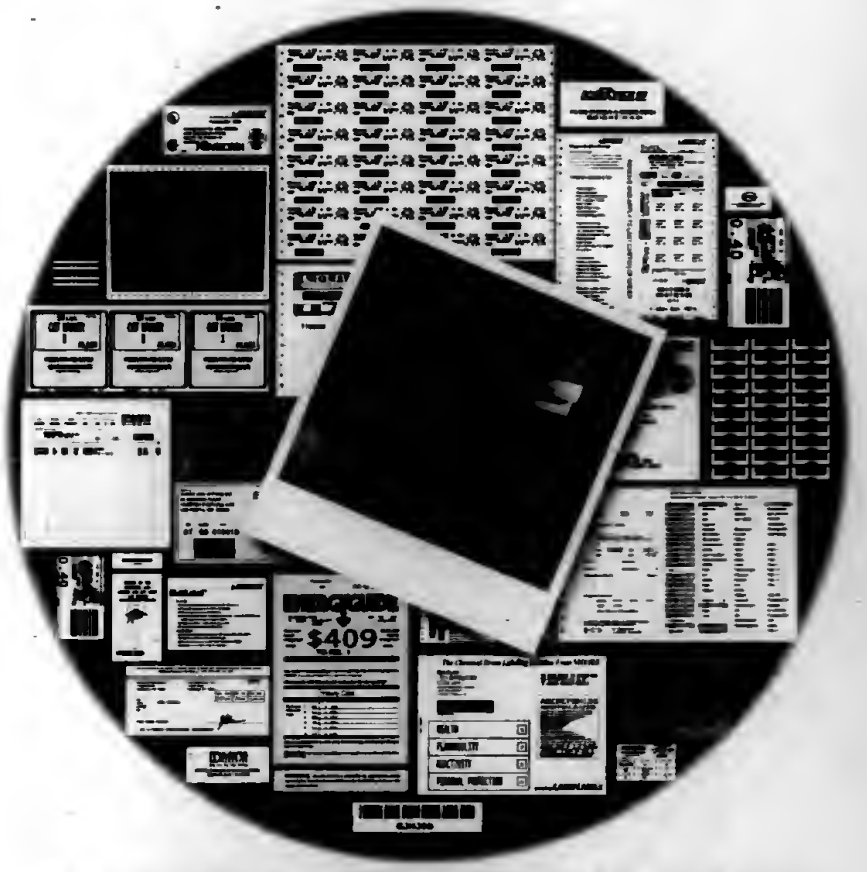
SoftArc, Inc. has introduced FirstClass Fax Gateway 2.0 for Macintosh.

According to the Markham, Ontario, company, FirstClass Fax Gateway 2.0 for Macintosh lets SoftArc FirstClass users fax messages, text files and graphics to any fax destination.

FirstClass Fax Gateway 2.0 features grayscale fax capabilities, multihop name resolution and a console display of gateway status. It was designed to run on a dedicated Macintosh — with a minimum of 4M bytes of available RAM — along with a fax modem and a phone line.

FirstClass Fax Gateway 2.0 for Macintosh costs $495.

▶ *SoftArc*
(905) 415-7000



The perfect departmental printer would need to be well-rounded.

Picture a mid-range departmental printer that prints laser quality images on both continuous form and cut sheet stock. On pre-printed forms or electronic forms you create. And prints on just about any media you can think of—2-up customer statements, checks, invoices, barcode labels, pick lists and hang-tags. In fact, everything you see in the visual above and a lot more. Imagine features like DuraFusion™, a unique flash fusing toner system that prints incredibly tenacious images on all sorts of materials. And while you're at it, add affordability, a workhorse duty cycle and speeds up to 31-pages per minute. The perfect departmental printer. It's called the L5031 MultiFunction Printer and it's here now, ready to round out your printing capability. You can see it in action in a free video that's yours for the asking.

PRINTRONIX™
What will we think of next.

For more information, write, call or fax: Printronix, P.O. Box 19559, Irvine, CA 92713; Telephone **(800) 665-6210**; Fax (714) 660-8682
DuraFusion is a trademark of Printronix. © 1995 Printronix

©1995 Hewlett Packard Company GS19502

Your people are screaming for better information. Your boss is hammering you on costs.

What computer system do you have?

You can satisfy everyone by evolving your legacy computing environment with Hewlett-Packard. We offer the hardware, software and services you need to migrate to a flexible, enterprise-wide client/server environment. We're currently providing thousands of companies around the globe with the solutions for better decision-making and quicker customer response. If the business decisions are yours, the computer system should be ours.

HEWLETT® PACKARD

Computer Systems

[illegible] is flat.
Lead can be [illegible] into gold.
[illegible] is proprietary.

If the notion that fault tolerance can't be open is about to put you over the edge, we'd like to open your eyes to our new family of Continuum™ systems.

They run FTX,® our industry-standard UNIX® System V Release 4 multiprocessing operating system. They're fully compliant with SVID, Issue 3, POSIX 1003.1, and X/Open's XPG3 standard. And they're completely fault tolerant. So you double the gain for your business—through openness and fault tolerance.

Continuum's fault tolerance is automatic. In fact, fault tolerance is built right in so you never have to program for it. Quite a departure from all the extra money, time, and resources it takes to make an IBM, HP, or Sun merely highly available.

And Continuum's fault tolerance costs less than high availability. Our systems give you the industry's best price/performance, too. And each one is backed by the industry's only 100% Availability Guarantee.

Call us for The Standish Group report on availability to see how Continuum flattens all the myths about fault tolerance. Call 1-800-STRATUS (787-2887), email us at facts@stratus.com, or reach us at www.stratus.com on the worldwide web.

Stratus

Automatic Availability.

Necessity is the mother of invention

Cluster of Unix workstations taps power of desktops, replaces costly supercomputers

By Jean S. Bozman

The network *can* be the computer after all. Three universities plan to prove that this summer as they lash clusters of Unix workstations together into a multisite "meta-computer."

This massive cluster of Unix workstations, which will link desktops at the universities of Pennsylvania, Maryland and Illinois, is a giant proof-of-concept for meta-computers. Meta-computers are systems that live on the network and tap the memory, CPU and storage resources of individual computers.

Called the National Scalable Cluster Project (NSCP), the effort corrals the power of low-cost desktops and Asynchronous Transfer Mode (ATM) networks as an alternative to buying costly supercomputers or massively parallel machines.

"It's a computer system where the parts are geographically spread out, and yet we're trying to make it look as if they're all in the same room," said NSCP project director Robert Hollebeek, a physics professor at the University of Pennsylvania.

All eyes watching

If the project works, information systems managers at large corporations and government agencies will take note. Analysts said that despite the NSCP's emphasis on scientific computing applications, it could end up pushing many resource-hungry data-mining applications out onto enterprise networks. The project is already searching terabytes of physics data for patterns, calculating computational fluid dynamics problems and testing a multimedia video server.

"Any large corporation with large amounts of distributed data could benefit from this technology," said NSCP co-director Bob Grossman, a mathematics and computer science professor at the University of Illinois at Chicago.

Jim Swanson, vice president of distributed operations at CS First Boston's fixed-income trading unit in New York, said his group already uses a home-grown load-sharing module called Scavenger to "scavenge" cycles from idle workstations for on-the-fly calculations.

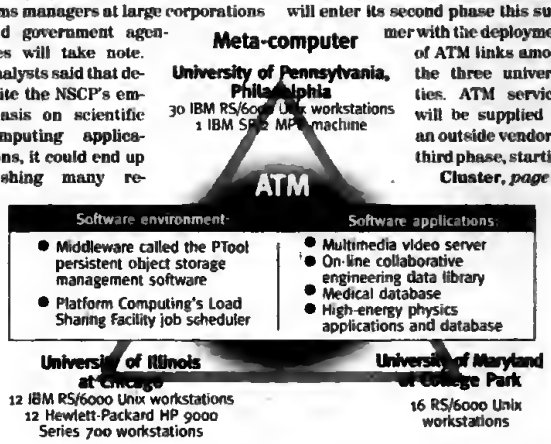
> **"Any large corporation with large amounts of distributed data could benefit from this technology."**
>
> **—Bob Grossman, NSCP co-director**

Problem solved

But NSCP's use of ATM and object-management software gets around bottlenecks in network computing, Swanson said. "We're using Ethernet. They're using ATM," he said. "They can afford to send large pieces of data between the workstations because they have more bandwidth."

The two-year effort, funded with a $4 million National Science Foundation grant it received last November, will enter its second phase this summer with the deployment of ATM links among the three universities. ATM services will be supplied by an outside vendor. A third phase, starting

Cluster, *page 68*



IBM puts mainframe engine in PC server

By Craig Stedman

IBM has a message for customers still trying to scrape by with 1980s-era water-cooled System/370 mainframes: Buy a PC server, already.

The computer giant made that a viable option recently when it introduced a piece of pint-size iron bundled into one of its PS/2 servers. Due to ship next month, the server/mainframe combination uses a board-level System/390 processor based on IBM's new CMOS technology. Prices start at less than $100,000 (see chart).

The new PC Server 500 S/390 offers only about 2 MIPS of mainframe processing power, and its I/O throughput is limited compared with a stand-alone System/390 box, analysts said. Nonetheless, the hybrid is viewed as a worthy cut-rate platform for off-loading application development and some low-end or distributed processing from big, water-cooled mainframes.

Mike Kahn, an analyst at The Clipper Group, Inc., a consultancy in Wellesley, Mass., said the 500 S/390 "chokes if you have many people using it heavily with a relational database." For example, IBM guidelines indicate that the machine can handle only 25 or so MVS application developers at one time, he said.

But the hybrid system could be useful even in large shops that want to distribute processing to branch offices or retail stores without going through the pain and cost of rewriting applications for another platform, Kahn added. "I expect to see some companies installing hundreds of these," he said.

As part of its effort to secure the mainframe's place in the client/server world, IBM also hopes the 500 S/390 will help attract more software vendors to write System/390 applications. In the past, Unix developers have been scared off by the high cost of mainframe hardware, software and service bureau time.

But Charles Lickel, vice president of business plans and systems architecture at IBM's System/390 division in Poughkeepsie, N.Y., said software vendors can buy the 500 S/390 hardware for about $12,500. IBM will then loan all the necessary software free of charge for up to 18 months to vendors that commit to delivering a System/390 application within that time frame, he added.

IBM PC server, *page 68*

Mainframe in a box

IBM's PC server/mainframe hybrid includes the following features:

MAINFRAME PROCESSING BOARD

Processor: CMOS-based System/390 chip
Memory: 32M to 128M bytes
Operating system: MVS, VM or VSE

PC SERVER

Processor: 90-MHz Pentium
Memory: 32M to 256M bytes
Internal disk capacity: 38G bytes
Operating system: OS/2 Warp with Communications Manager/2

BASE PRICE

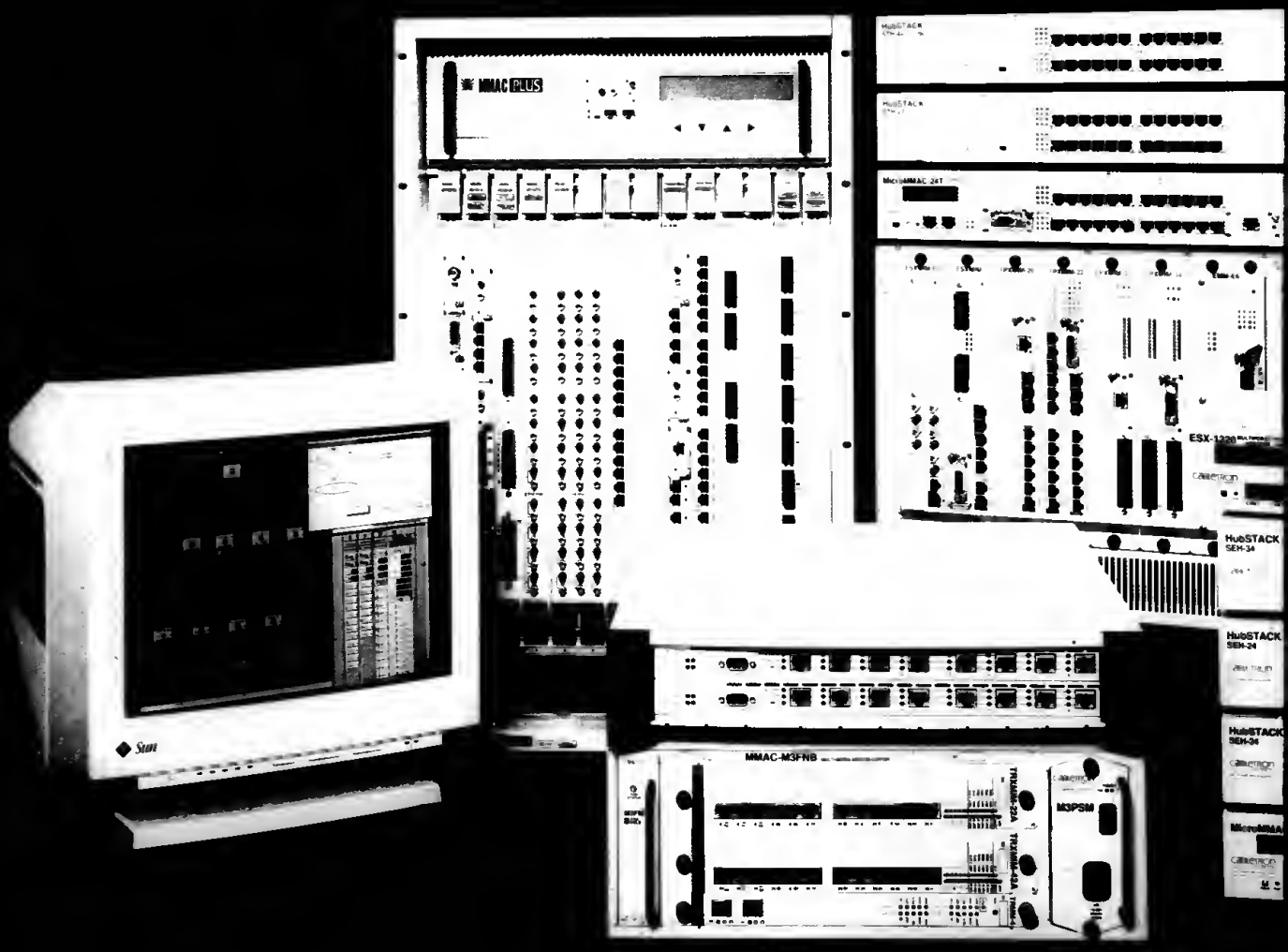
With MVS: $85,000 to $95,000
With VM or VSE: $55,000 to $65,000

Quick return

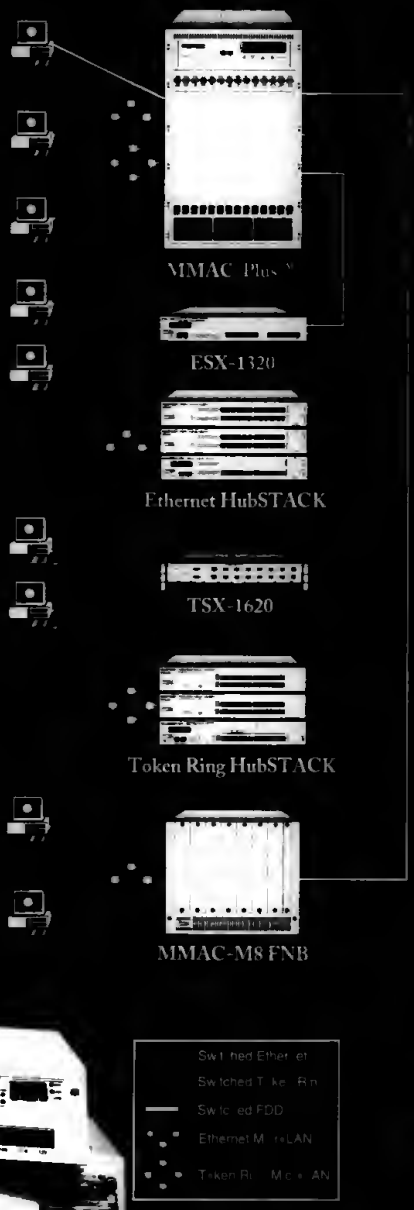
Carolina Steel Corp., a steel manufacturer and distributor in Greensboro, N.C., said it expects an immediate payback from switching to a leased 500 S/390 server from an old 4381 mainframe. "I can just throw the current hardware away, and I'd still be saving money," said Charles Rice, corporate manager of information systems at the company.

Power, cooling and maintenance costs should all drop significantly, and getting rid of the 4381 and its attached 3880 disk subsystems will reduce the amount of floor space needed, Rice said. The new box "is going to sit in my PC room with the other servers," he said. "It'll be just another server on the rack."

Carolina Steel has been testing the 500 S/390 and planned to put the system into production for its 200 CICS users last week. During the testing, performance was similar to the 4381 on I/O-intensive applications and was faster than the water-cooled box on other jobs, Rice said.


MMAC PLUS
HubSTACK
HubSTACK
MicroMMAC 24T
ESX-1000
Cabletron
HubSTACK SEH-34
HubSTACK SEH-34
HubSTACK SEH-34
Cabletron
MicroMMAC
Cabletron
MMAC-M3FNB
M3PSM
Sun

Solutions today. Revolutions tomorrow.



Teach your old LAN new tricks with Cabletron's complete line of Ethernet, Token Ring and FDDI switching products. We offer the industry's most scalable line of switches—from standalones and stackables, to modular departmental switching hubs, to the MMAC-Plus enterprise switch.

Cabletron's scalable packet switching solutions help put an end to your bandwidth problems, while beginning a whole new era of performance, manageability and interoperability. That's because all of Cabletron's switching products are part of the Synthesis framework: the revolutionary migration path that takes you, and your existing networking investment, to the virtual enterprise internetworks of tomorrow.

With just a simple firmware upgrade, our new virtual network server and advanced management applications, you'll soon say goodbye to configuration problems, runaway WAN bills, bottlenecks and failures. And say hello to a virtual paradise . . . a Synthesized virtual network.

For more information, call (603) 337-2800 or e-mail us at sales@ctron.com. And ask for your free Synthesis white paper and Network Solutions catalog.

SYNTHESIS™

The Complete Networking Solution™

Corporate Headquarters:
35 Industrial Way, Rochester, NH 03867
Internet: http://www.ctron.com

Cognos Corp. has announced Impromptu 3.0, an enterprisewide, interactive database reporting tool

According to the Burlington, Mass., company, Impromptu 3.0 gives database querying access to users at all levels of an enterprise. It can run queries in the background while working on other tasks, and it gives advance notice on report lengths and supports combination lists, crosstabs and graphs in one report.

Impromptu 3.0 features an object-oriented architecture that treats Impromptu's information catalogs as database-independent objects. It also includes database-independent templates designed to speed the deployment of report generation. It integrates with Windows as a Microsoft Corp. OLE 2.0 client and server.

Impromptu 3.0 costs $495 for the user version and $595 for the administrator version

▶ *Cognos*
(617) 229-6600

Opera Systems, Inc. has introduced the MSS-128a, a mass storage server

According to the Danvers, Mass., company, the MSS-128a is an integrated tape library server that provides up to 1T byte of storage capacity in 2 square feet. It uses Digital Equipment Corp.'s 233-MHz Alpha processor with 512K bytes of cache and up to 192M bytes of main memory.

The product supports as many as seven DDS-2 digital audio tape drives and up to six SCSI-2 disk drives.

The MSS-128a was designed for storage-intensive applications running under Digital's OpenVMS, Digital's Unix or Microsoft Corp.'s Windows NT.

Pricing begins at $53,990 for the build-to-order MSS-128a

▶ *Opera Systems*
(508) 750-4700

XPoint Corp. has introduced FormsXpress 4.0, electronic forms design and printing software for the IBM AS/400

According to the Norcross, Ga., company, FormsXpress 4.0 lets companies create and print single or multipart forms, checks, labels and other documents with advanced spool data mapping features

The data mapping features include row line and field compression, unlimited conditioning and forms sorting

FormsXpress 4.0 also supports color and thermal transfer printers and has faxing capability in conjunction with Quadrant Software's FastFax family of products.

Pricing for FormsXpress 4.0 starts at $4,000

▶ *XPoint*
(404) 446-2764

IBM PC server

CONTINUED FROM PAGE 65

Byron Vranas, director of enterprise systems at Software AG of North America, Inc. in Reston, Va., said the company has been paying $40,000 to $60,000 per month in mainframe software costs alone. Software AG, one of the leading mainframe application vendors, expects to do more than 90% of its development on the 500 S/390, Vranas added. It is likely that only large-scale testing will still have to be done on a full-size mainframe.

Pricing unclear

One uncertainty is how software vendors will price their applications on the 500 S/390 because mainframe license and maintenance fees are usually tied to processor capacity and can cost millions of dollars. Vendors will "have to create a completely separate pricing structure for this box," said Eric Vaughan, president of IntelliWare Systems, Inc. in Arlington, Texas.

Steve Harriman, vice president of marketing at Sterling Software, Inc.'s VM software division in Reston, Va., said Sterling's systems management products will cost about $20,000 on the hybrid system.

The cost can approach $500,000 on a water-cooled System/390, he added. Software AG will also price its offerings "in the tens of thousands of dollars" for the 500 S/390, Vranas said.

Cluster links universities

CONTINUED FROM PAGE 65

in mid-1996, will seek additional sites to join the project, Hollebeek said.

Outsiders will benefit, too, because the university users plan to release meta-computer middleware by late 1996. The project's PTool persistent object storage management software is already posted on the University of Illinois at Chicago's Internet home page for users to download (http://www_lac.eecs.uic.edu/). And IBM, Xerox Corp. and Platform Computing Corp. all support the project, each with an eye toward refining its distributed software products.

Prime partners

Prime business partners for the meta-computer cluster include the following companies: IBM, which is supplying and supporting new IBM RS/6000 workstations; Xerox, which is contributing collaborative engineering software; and Platform Computing, which supplies its Load Sharing Facility job scheduler for submitting batch jobs to distributed workstation arrays.

Waiting game?

Industry analysts said building a unified computer on a network is a laudable goal, but some are poking holes in the theory. Supercomputer watcher Gary Smaby, president of Smaby Group, Inc. in Minneapolis, likened the network to an old-fashioned telephone party line, where busy lines mean delays. However, Hollebeek said ATM protocols will dedicate bandwidth to allow priority jobs to get through.

Another foible could be system overhead in which CPUs waste cycles sending messages back and forth, said Christopher Willard, a senior analyst at International Data Corp. in Framingham, Mass. But Hollebeek said applications such as data-mining, database requests and video-server image management lend themselves to parallel processing on the network.

If special software can overcome the possible performance hang-ups, then the meta-computer idea could thrive outside the laboratory. "If they can make it work, it will be a technical tour de force," Willard said.

Cabletron's Educational Seminar Series Presents

CONTROLLING THE VIRTUAL NETWORK REVOLUTION

Virtual networking promises to simplify our lives by solving many of the problems associated with today's diverse, enterprise internetworks. But what is a virtual network, and how do you get there without losing your existing investment in shared-access LAN and SNA equipment?

To help address these issues and to explain, fu[illegible] virtual network—reduced cost of network ownership, ease of use and administration, [illegible] a complimentary seminar. This informative half-day session will feature so[illegible] who will discuss the idea behind a true, switched virtual enterprise network, and [illegible] pany's needs.

Controlling the Virtual Network Revolution w[illegible]

- Boston, MA - 5/2
- Raleigh, NC - 5/3
- Atlanta, GA - 5/4
- Philadelphia, PA - 5/10
- Wash[illegible]
- New [illegible]
- Minn[illegible]
- Clev[illegible]
- Phoenix, AZ - 6/8
- Seattle, WA - 6/12
- Portland, OR - 6/13
- San Jose, CA - 6/14
- Los Angeles, CA - 6/15

CABLETRON SYSTEMS
The Complete Networking Solution™

24-Hr. Reg[illegible]
Please specify da[illegible] Reserve your seat today!

Data Warehousing: Don't Try It Without Informix.

If you're thinking about building data warehouses—whether gigabytes or terabytes in size—you're not alone. Hundreds of progressive, dynamic organizations are doing the same thing. And many of them—like MCI, Transamerica Commercial Finance, The Home Depot, and DHL Worldwide Express—are making the move with the leader in data warehousing, Informix.

Why? Because no other open systems database vendor:

- Has a strategy that *begins* with an architecture rather than add-on features, ensuring solutions that last.

Parallel Data Query	Dynamic Systems Administration
Parallel Loading	Systems Management
Parallel Indexing	Very Large Database Support
Parallel Index Scans	Multidimensional Analysis Capabilities
Parallel Sorts and Joins	Large Selection of Data Access Tools
Parallel Inserts/Deletes/Updates	Transparent Optimization
Parallel Backup and Recovery	Query Monitoring
Database Partitioning	Open Systems Standards
High Availability	Support for SMP and MPP

- Provides truly *scalable* performance to power your data warehouse.
- Has the breadth of partners you need for a total solution.

Informix technology is a perfect fit for data warehouse applications. That's why Bill Inmon, author of *Building the Data Warehouse* says,

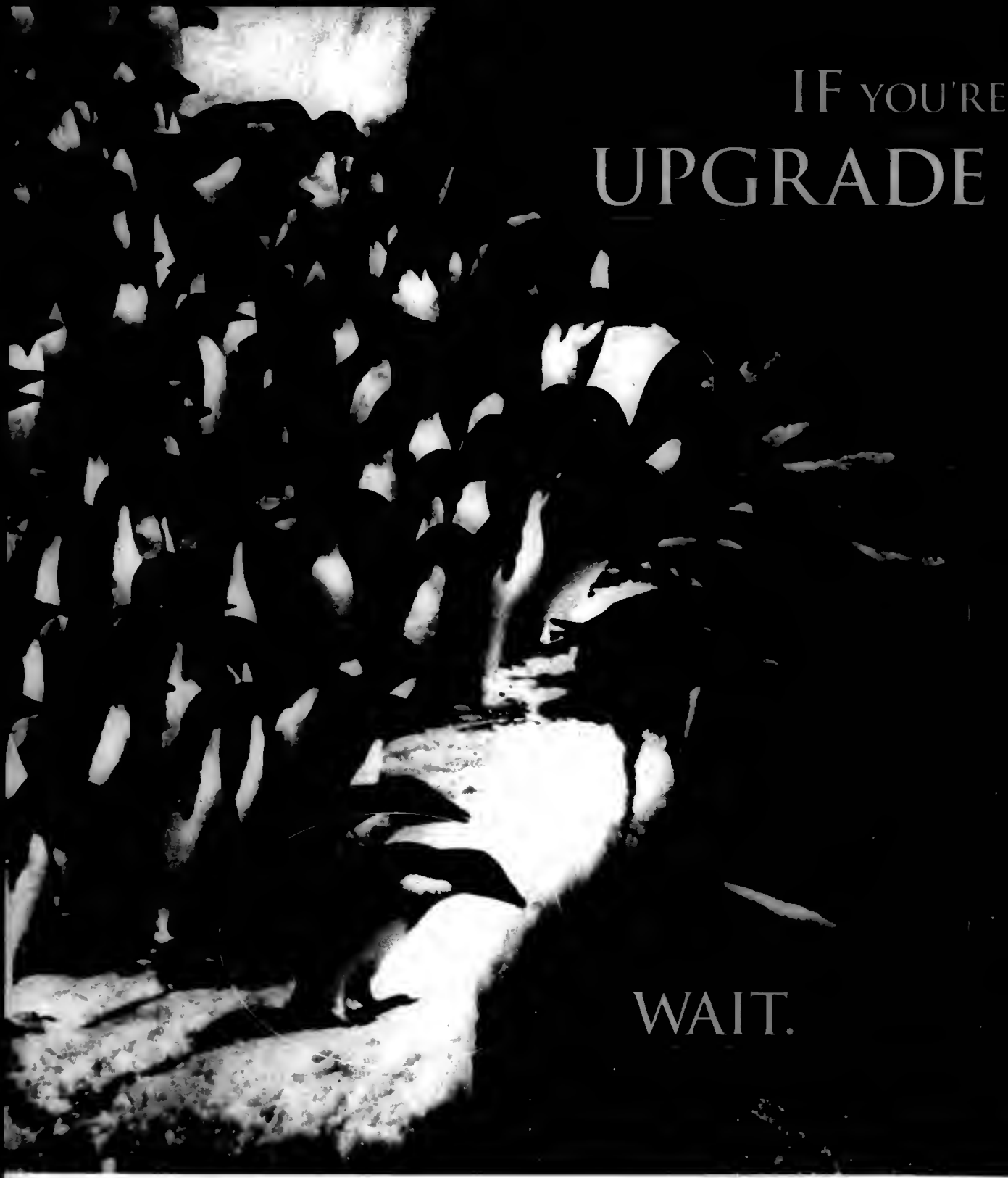
"Informix's partitioning and parallel capabilities give it a clear advantage when it comes to data warehousing."

Put Us on Your List.
We'll send you more information about data warehousing. Send or call toll free: 1-800-688-IFMX, ext. 71 for your free kit.

INFORMIX®

Find us on the Web! http://www.informix.com/

© 1995 Informix Software, Inc. Informix is a registered trademark of Informix Software, Inc. and Dynamic Scalable Architecture is a trademark of Informix Software, Inc.



Microsoft offers flexible, cost-effective options for licensing BackOffice products. Acquire a Server License for the product and a Client Access License for each client computer that accesses the product. A Client Access License allows a computer to access the product on any server on the network. Site usage patterns may vary, a concurrent use option is also permitted. ©1995 Microsoft Corporation. All rights reserved. Microsoft is a registered trademark and Where do you want to go today? and Windows NT are trademarks of Microsoft Corporation. Macintosh is a registered trademark of Apple Computer Inc. DEC and Alpha AXP are trademarks of Digital Equipment Corporation. NetWare and Novell are registered trademarks of Novell, Inc. PowerPC is a trademark of International Business Machines Corporation. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company, Ltd. Intel is a registered trademark of Intel Corporation. MIPS is a registered trademark of MIPS Computer Inc. Oracle is a registered trademark of Oracle Corporation. Sybase is a registered trademark of Sybase Inc.

PLANNING TO YOUR NETWORK,

Before you plunge into your next network upgrade, you ought to consider your options. To be competitive today you need more from your network than file and print. You also need reliable access to mission critical business information. You need Windows NT Server, the best upgrade option for your NetWare system.

more deta Ca

MULTIPURPOSE SERVER

FAST FILE & PRINT
(PROTOCOL INDEPENDENT, INCLUDING NETWARE)

GENERAL APPLICATIONS
(1300 AT LAST COUNT)

DATABASES
(MICROSOFT, ORACLE,® SYBASE®)

COMMUNICATIONS
(DIAL-IN NETWORK ACCESS, ISDN, SNA)

INTEGRATED MESSAGING

•

INSTALLATION & ADMINISTRATION

EXPRESS SETUP
(HARDWARE DETECTION, DRIVERS ON CD ROM)

UPGRADE TOOLS
(NETWARE LAN MANAGER)

DIRECTORY SERVICES
(CENTRALIZED ADMINISTRATION, SINGLE LOG-IN TO NETWORK)

DESIGNED FOR C-2 LEVEL SECURITY
(SERVER AND NETWORK)

•

OPEN PLATFORM

PROTOCOL INDEPENDENT
(TCP/IP, IPX/SPX, NETBEUI, DLC,)

NETWARE SUPPORT
(FILE & PRINT SERVICE, GATEWAY SERVICE, IPX/SPX)

MACINTOSH® CLIENTS
(NO SPECIAL SOFTWARE REQUIRED)

UNIX® AND INTERNET
(FTP, DNS, WWW, GOPHER READY, . .)

PROCESSOR INDEPENDENT & SMP READY
(INTEL® DEC™ ALPHA AXP,™ MIPS® R4X00, POWERPC™)

Corporate Software	Egghead	Softmart	Dell
(800) 808-1667	(800) EGG-1123	(800) 243-6292 ext. 817	(800) 449-3355

Microsoft

WHERE DO YOU WANT TO GO TODAY?™

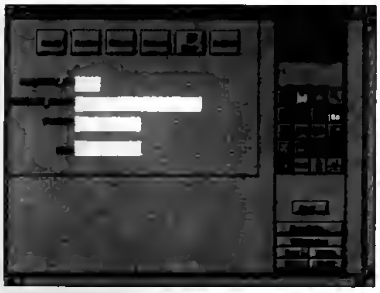
Now there's a faster way to build Gupta SQLWindows applications.

1. Design your ◄ database.

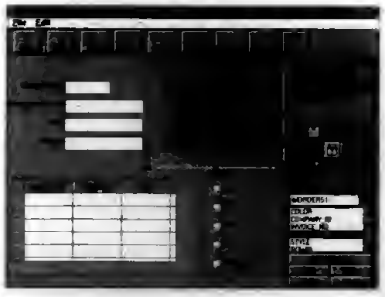
2. Add client-side attributes. ►

▲ 3. Fire up your ER*win* QuickObject.

4. Instantly prototype your screens. ►



5. Congratulations. Your application's ready to run. ►



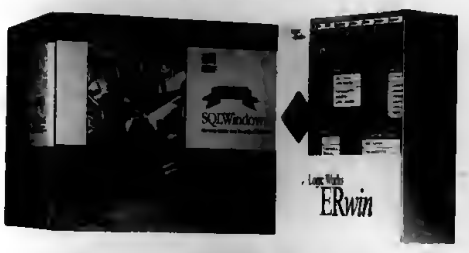
Introducing ER*win* for SQLWindows.

Looking for rapid development? Nothing tops the combination of ER*win*® for SQLWindows and Gupta SQLWindows. It's the first environment that prototypes your client and server sides at the same time.

Check out this productivity. ER*win* lets you graphically design your database and specify extended attributes (values that control the behavior and look of SQLWindows screens) within your database design. And then encapsulates the database design within SQLWindows as a QuickObject. Fire up the ER*win* QuickObject, and data-aware, ready-to-run forms are instantly generated! No more juggling between your screens and database to keep definitions in sync.

SQLWindows' QuickObjects—powerful pre-built objects—let you graphically design database independent applications. ODBC support for open connectivity and native routers for databases like Oracle, Sybase, CA-Ingres and DB2 let you scale an application as you go, from a single PC to a department server, to the entire enterprise.

For a limited time, you can save over $1,000 on a special ER*win* for SQLWindows and Gupta SQLWindows 5.0 bundle.



Call 1-800-78-ERWIN, dept. W today!

GUPTA™

logic works

©1995 Logic Works, Inc. ERwin is a trademark of Logic Works, Inc SQLWindows is a trademark of Gupta Corporation All other products mentioned are trademarks of their respective companies

SAP, D&B users await distributed capability

Client/server suites to deliver new functions by year's end

By Rosemary Cafasso

The ability to leap from centralized computing to truly distributed computing will become a reality later this year for client/server users of SAP AG and Dun & Bradstreet Software applications — as long as the vendors hold true to their promises.

In upcoming releases of their application suites both companies will take different approaches to deliver distributed functionality. But they will also rely on some similar technologies such as messaging services and remote procedure calls as well as provide support for database replication technologies. Such enhancements would enable users to cut ties to a central server database and allow them to install the application suite wherever it makes the most sense in their organizations.

That is good news for many users who said distributed capabilities are a requirement for their long-term client/server plans.

"It's encouraging to see them moving in that direction," said John Christopherson, director of information systems planning and financial systems at United HealthCare Corp. in Minneapolis and a D&B SmartStream user. "We see the advantages of scalability and [centralized] database independence as being very important to our long-term strategy."

Both vendors now provide client/server applications that rely on a centralized database approach. This does not preclude application modules from running remotely, but they would be essentially cut off from the main database. And in the case of SAP, applications running on multiple servers would not automatically share data and function as an integrated suite.

With the distributed technology that the companies are preparing, users could set up application modules and databases at different locations. Then users could replicate data from the central system to the remote system, and applications could exchange information.

"This is important for a global company because the network infrastructure [for a centralized system] simply doesn't reach all parts of the world," said Mike Capellas, director of MIS at Schlumberger Ltd. in Houston. Schlumberger is currently installing SAP's R/3 client/server financial suite.

Two client/server application providers will soon provide distribution capabilities

	Key technologies	Availability
SAP AG	SAP-developed middleware	Late 1995, with Release 3.0 of R/3
D&B Software	Workflow engine, distribution catalog, messaging services	Fourth quarter, with SmartStream Distributed Enterprise

Talk is cheap

SAP has been talking about its distributed plans for about a year, with plans to ship tools before the end of 1995, whereas D&B Software just announced its strategy last month. Analysts said D&B Software is out in front in terms of the thoroughness of its approach.

"I don't think the [D&B Software] architecture is novel with respect to new technology," said Judy Hodges, an analyst at International Data Corp. in Framingham, Mass. "It's the implementation that is ahead of where the competition is."

The firm essentially designed SmartStream from the ground up to accommodate a distributed environment and will include such basics as a distributed workflow engine.

For now, at least, SAP is focusing on its Application Link Enabling (ALE) middleware. ALE is message-oriented middleware that sits as a layer on top of R/3 modules. It would let R/3 applications send messages to one another and exchange data (see story at left).

Chevron spreads its R/3 wings

Chevron Corp. in San Ramon, Calif., is one SAP AG user gearing up to distribute its R/3 client/server applications.

The company is working with an early version of SAP's ALE technology to enable the remote distribution of R/3 throughout several company locations. ALE, which is middleware that would allow R/3 applications to exchange data and information, is "one of our key initiatives for 1995," said Bob Washa, SAP technical manager in Chevron's advanced financial IS group.

With ALE, Washa said his team will be able to set up a master/slave R/3 configuration in which one master system will maintain R/3 data, and various R/3 subsystems will contain copies of it. ALE will manage updates from the remote sites to keep the master files current with any changes that take place in the field.

In addition, ALE will enable Chevron to split up R/3 application modules so financials can be run in certain locations, and other applications, such as plant management, can be run at various remote sites. With this configuration, ALE will enable the applications to share data and essentially function as an integrated suite.

Currently, all of the R/3 modules must be on the same server, working with the same database to achieve that integration.

—Rosemary Cafasso

Outsourcing

AT&T Solutions takes on broader service role

By Julia King

AT&T Solutions does not want to be your outsourcing vendor. Rather, the 3-month-old unit of the telecommunications giant wants to be your "technology life cycle management company."

There is a big difference between the two, according to AT&T Solutions President and Chief Executive Officer Victor E. Millar.

"We obviously are doing the traditional [information technology] infrastructure management — everything from mainframes through servers and down to desktops," Millar said in a recent interview.

"But we also are now moving upstream to managing the business applications that are being supported on the computer platforms," he added.

"We're in a position to take over virtually any part of a business function clients would like us to manage."
—Victor E. Millar, president and CEO, AT&T Solutions

Top to bottom

For example, AT&T Solutions, based in Washington, will not only design and build a network and computer systems to support a corporation's customer service call center. It will actually staff and run the entire operation on a day-to-day basis.

Analysts said this strategy is similar to that of other top vendors, including Electronic Data Systems Corp. and Andersen Consulting, which both emphasize their roles as business function outsourcers.

"Another stage in outsourcing is taking more and more nonvalue-added functions and moving them outside of a company," said Natasha Krol, an analyst at Meta Group, Inc. in Stamford, Conn. "Companies are actually elevating outsourcing to a different level."

So far, AT&T Solutions has managed to snag several high-profile contracts, particularly in the banking sector. The Chase Manhattan Bank NA and Great Western Bank, the second-largest thrift institution in the U.S., are both customers.

So is First National Bank of Chicago, which contracted AT&T as its prime vendor shortly after the U.S. Treasury designated the bank as a financial agent for an electronic federal tax payment system.

Recently, AT&T also made inroads into the health care and transportation industries. In March, the company signed a deal with Equifax, the Atlanta-based consumer credit information company.

Transportation giant CSX Transportation, Inc. in Jacksonville, Fla., has also contracted with AT&T Solutions. Together with AT&T Bell Laboratories, Millar's unit will design and manage a new telecommunications system. Terms of the 10-year, $250 million deal call for CSX to convert entirely from its private analog microwave and fiber network to AT&T's public voice and digital network.

The design will allow CSX Transportation to take advantage of the intelligence in AT&T's network without diverting resources from its core rail operations, said John F. Andrews, president of CSX Technology, the railroad's information systems arm.

Home alone?

One way AT&T Solutions is looking to distinguish itself from competitors is by focusing specifically on electronic commerce, said AT&T Solutions President and CEO Victor E. Millar.

Building networks and network-based applications to support widely dispersed workers — notably telecommuters — is another key part of the unit's strategy, he added.

"If you look at the volume of [electronic commerce] transactions today, 95% are still internal to companies," Millar said. "But if working at home turns out to be as dramatic as I think, you're talking about your clients' people at home working with suppliers' people at home and customers' people at home. All of a sudden, you're talking about a huge network," he said.

—Julia King

Computerworld Editorial Calendar

July - September, 1995

Issue Dates	Ad Closings Color*	Ad Closings B&W	Editorial Features & Custom Publications	Show Distribution & Ad Readership Study Issues
July 3	June 16	June 23	**CW Guide To: PDAs** Personal Digital Assistants, the latest evolution of microprocessor power in a small package, present unique buying options and support issues for IS organizations. This Guide will examine the leading products and tasks IS has in selecting and managing them. **Buyers' Satisfaction Scorecard:** Market leading PDAs **Firing Line:** Newest PDA from a leading vendor	
July 10	June 23	June 30	**Closer Look:** Unisys	Starch Study
July 17	June 30	July 7	**CW Guide To: DBMS** The focus of database management systems is as the server for a variety of applications. Depending on the application type, IS organizations face varied buying decisions. We will examine which databases match which application needs best and analyze the leading products in each area. **Buyers' Satisfaction Scorecard:** Market leading SQL database mgmt. systems for midrange servers **Firing Line:** Latest DBMS from a leading vendor	
July 24	July 7	July 14	**Closer Look:** Power Macintosh	**Enterprise Computing** Chicago 7/26 - 7/28
July 31	July 14	July 21	**CW Guide To: Workgroup and Collaborative Software** Beyond e-mail and document management users are seeking products that help them manage business processes and work as teams. This Guide will examine how well the vendors are meeting this need **Buyers' Satisfaction Scorecard:** Market leading workgroup software **Firing Line:** Latest collaborative product from a leading vendor	
Aug.	June 28		**Computerworld Client/Server Journal** **Vertical Market Focus:** Insurance **Section Feature:** Product Focus on Networking	Object World Networks Expo Interop + Networld Unix Expo Harvey Study
Aug. 7	July 21	July 28	**Special Report:** Re-engineering the Workplace	
Aug. 14	July 28	Aug. 4	**CW Guide To: Desktop Databases** Personal databases that act as front ends to company applications and DBMS, as well as PC-based packages that serve the needs of workgroups or departments will be examined with the focus on IS buying decisions. **Buyers' Satisfaction Scorecard:** Market leading desktop databases **Firing Line:** Latest DBMS from a leading vendor	**Object World** San Francisco 8/15 - 8/17
Aug. 21	Aug. 4	Aug. 11	**Closer Look:** Sun Workstations	
Aug. 28	Aug. 11	Aug. 18	**CW Guide To: Client/Server Financial Applications** One of the first applications companies move off of the mainframe is financials. But only recently have the vendors begun producing true client/server offerings. We'll look at how users like them and what more they need. **Buyers' Satisfaction Scorecard:** Market leading client/server financial software **Firing Line:** Latest client/server financial software from a leading vendor	Starch Study
Sept. 4	Aug. 18	Aug. 25	**Special Report:** Annual Salary Survey	
Sept. 11	Aug. 25	Sept. 1	**CW Guide To: Internetworking Routers and Hubs** Facing competition from many areas, routers and hub vendors are adding capabilities and repositioning themselves. How do these changes affect IS buying plans and what is the future internetworking product set? **Buyers' Satisfaction Scorecard:** Market leading hubs and routers. **Firing Line:** Latest hub or router from a leading vendor **Custom Publication:** Object Application Awards Supplement	**Networks Expo** Dallas 9/12 - 9/14 Starch Study
Sept. 18	Sept. 1	Sept. 8	**Closer Look:** Client/Server Manufacturing Software	
Sept. 25	Sept. 8	Sept. 15	**CW Guide To: ATM Switches** ATM is becoming more widely installed and product offerings are multiplying. What are the benefits and caveats of this new high-performance technology? **Buyers' Satisfaction Scorecard:** Market leading ATM switches **Firing Line:** Latest ATM software from a leading vendor **Custom Publication:** White Paper on The Business Case for Client/Server (part 3 of 4-part Enterprise Software Directions Series)	**Interop + Networld** Atlanta 9/25 - 9/29 **Unix Expo,** New York City 9/26 - 9/28

Editorial contacts (508) 879-0700 Management Features: Allan Alter, Closer Look: James Connolly, CW Guide To: Michael Sullivan-Trainor, Buyers' Satisfaction Scorecard: Michael Sullivan-Trainor, Firing Line: Kevin Burden, Re-engineering the Workplace & Electronic Commerce: Joe Maglitta
Custom Publications are written independently of the Computerworld editorial staff. For more information on Custom Publications, contact Carolyn Novack at (508) 879-0700.
* Includes ads within special editorial features and premium positions.

Computerworld Editorial Calendar October - December, 1995

Issue Dates	Ad Closings Color*	Ad Closings B&W	Editorial Features & Custom Publications	Show Distribution & Ad Readership Study Issues
Oct.	Aug. 23		**Computerworld Client/Server Journal** **Vertical Market Focus:** Transportation **Section Feature:** Product Focus on Database Tools	Software Developers' Conference SIM Fall Conference Harvey Study
Oct. 2	Sept. 15	Sept. 22	**Closer Look:** Lotus **Custom Publication:** White Paper on Manufacturing Technology: Managing for Change (part 3 of 4-part Manufacturing Series)	**Software Developers Conference** Washington, D.C. 10/3 - 10/7
Oct. 9	Sept. 22	Sept. 29	**CW Guide To: Large Scale Servers** Mainframes, massively parallel multi-processors and supercomputers have their place in large corporations where data and applications require enormous processing power. How do the leading products shape up in this category and how much flexibility do they offer IS? **Buyers' Satisfaction Scorecard:** Market leading large scale systems **Firing Line:** Latest large scale system from a leading vendor	
Oct. 16	Sept. 29	Oct. 6	**Closer Look:** ISDN Update/Frame Relay	Starch Study
Oct. 23	Oct. 6	Oct. 13	**CW Guide To: Network Operating Systems** As operating systems take on more management capabilities, the buying decision changes. IS managers must look at the benefits of increased functionality and the trials of implementing it. What are the NOS trade-offs? **Buyers' Satisfaction Scorecard:** Market leading LAN operating systems **Firing Line:** Latest LAN operating system from a leading vendor	**SIM Fall Conference** Orlando, FL 10/22 - 10/25
Oct. 30	Oct. 13	Oct. 20	**Closer Look:** PC Storage **Special Issue:** Campus Edition (mails 10/31)	
Nov. 1	Sept. 27		**Computerworld Client/Server Journal** **Vertical Market Focus:** Brokerage **Section Feature:** Product Focus on Development Tools	Comdex Fall Mobile World Client/Server World DB Expo Harvey Study
Nov. 6	Oct. 20	Oct. 27	**CW Guide To: Object-oriented DBMS and Development Tools** Is object-oriented the next wave in DBMS or is it an embedded technology that will gradually simply add functionality to present offerings? This question and how it affects IS buying decisions will be examined. **Buyers' Satisfaction Scorecard:** Market leading object-oriented DBMS **Firing Line:** Latest object-oriented DBMS from a leading vendor	Starch Study
Nov. 13	Oct. 27	Nov. 3	**CW Guide To: Desktop PCs** Pentium, PowerPC and other platforms will be examined with regard to the migration issues and performance gains they provide **Buyers' Satisfaction Scorecard:** Market leading desktop PCs **Firing Line:** Latest desktop PC from a leading vendor	**Comdex Fall** Las Vegas 11/13 - 11/17
Nov. 20	Nov. 3	Nov. 10	**Special Report:** Electronic Commerce	
Nov. 27	Nov. 10	Nov. 17	**Closer Look:** Internet Browsers	**Mobile World** Boston 11/28 - 11/30
Dec. 4	Nov. 17	Nov. 22*	**Closer Look:** Visual Development Tools **Custom Publication:** White Paper on Service Solutions for Client/Server (part 4 of 4-part Enterprise Software Directions Series)	**Client/Server World** Chicago 12/5 - 12/7 **DB Expo** New York City 12/5 - 12/7 Starch Study
Dec. 11	Nov. 22*	Dec. 1	**CW Guide To: Messaging Software and E-mail** With e-mail going through a major architectural change to client/server, the market will have a very different shape. IS should be able to purchase products that better address company needs. **Buyers' Satisfaction Scorecard:** Market leading e-mail software **Firing Line:** Latest e-mail package from a leading vendor **Custom Publication:** White Paper on Manufacturing Acquisition Strategies: A Guide for User Empowerment (part 4 of 4-part Manufacturing Series)	
Dec. 18	Dec. 1	Dec. 8	**Closer Look:** Contact Management Tools	
Dec. 25 Jan. 2	Dec. 8	Dec. 15	**Annual Forecast Issue** (1996 issue)	

* Includes ads within special editorial features and premium positions. * Please note early advertising close

With the SAS® System, we can integrate large amounts of data and build a picture of how our fields are performing.

Why Chevron U.S.A. Production Company Relies on the SAS System

Chevron

At Chevron U.S.A. Production Company, the quest is to be better than the best. Out in the field, engineers join forces with earth scientists, operations staff, and support personnel to produce millions of barrels of oil reserves...find and develop new sources of energy...and maintain quality and low cost at every stage of the oil and gas production process.

The Means to Make Better Decisions

Providing the means to deliver accurate and timely information to improve work processes and make better business decisions is the job of George Alameda, Chevron U.S.A. Production Company's Manager of Information Technology.

The company is using the SAS System to help with enterprise-wide information delivery. "Our mission is to make financial, operational, and reservoir data available in an easy-to-use format to all the asset teams at work in CUSA Production Co.," says Alameda. "We've found the SAS System is a superior solution for analyzing data, turning data into useful metrics, and guiding our cross-functional teams toward improved work processes."

One team, in CUSA Production's Western Business Unit, is tracking the profitability of individual wells. "It's a tremendously difficult task to optimize our field operations for maximum profitability," says Alameda. "With the SAS System, we can integrate large amounts of data and build a picture to compare one field against another and challenge our asset teams to identify and share best operating practices."

Reaching for the Best

Alameda looks forward to extending the use of the metrics and performance monitoring data to employees trying to improve their work processes. He admits his vision is far reaching, but so is the SAS System. "Our challenge is to be better than the best," he concludes, "and the SAS System is helping us reach that goal."

To receive a SAS System Executive Summary, give us a call or visit us on the World Wide Web at http://www.sas.com

SAS®

SAS Institute Inc
Phone 919-677-8200
Fax 919-677-4444
Email: cw@sas.sas.com
In Canada: 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc
Copyright © 1995 by SAS Institute Inc

SINGAPORE AIRLINES MOVES INTO INTELLIGENT SYSTEMS, 81

The object is access to relational data

By Elizabeth Heichler

While many application developers may be working in an increasingly object-oriented world, chances are good that the corporate data they need to access lives in a very different universe — a relational database.

To solve the problem caused by the mismatch between object-oriented applications and relational databases, users are turning to an array of different approaches (see chart), in recent weeks, two vendors have ridden into the breach, offering help through new functionality in their products.

Persistence Software, Inc. has announced Persistence 2.5, a new version of its object/relational interoperability software. The enhanced release will support multithreading features in SunSoft, Inc.'s Solaris operating system, which will improve performance — particularly for transaction processing applications, said Christopher Keene, president of Persistence in San Mateo, Calif.

A little competition

At the same time, Rogue Wave Software, Inc., the Corvallis, Ore., company known for its C++ class libraries, extended its DBtools.h++ library to add interoperability with The ASK Group, Inc. Ingres and Informix Software, Inc. databases. DBtools.h++ already provides interfaces to Oracle Corp.'s Oracle7, Sybase, Inc.'s Sybase and Microsoft Corp.'s SQL Server as well as an Open Database Connectivity (ODBC) interface.

"Object-relational enablers are critical because they allow you to buy new development tools and get the benefit of object-oriented programming and not throw out your relational databases," said Hugh Bishop, manager of emerging technologies research at Aberdeen Group, Inc. in Boston.

Users could avoid this problem by using object-oriented databases with object-oriented applications. But information stored in relational databases can be made available to a wider variety of applications than object-oriented databases, according to users and analysts.

Persistence and Rogue Wave offer users two very different approaches, and which is most appropriate depends on the nature of the application being developed, said Bill Baloglu, chief technologist at Object Focus, Inc., a Cupertino, Calif., consulting firm specializing in object-relational connectivity.

If an application is likely to perform mostly ad hoc queries, then DBtools.h++ will offer the necessary functionality, he said. But if the application involves database navigation and the need to bring multiple tables into a client-side cache and navigate through them, then Persistence, which offers caching capability, is probably the better tool, Baloglu said.

AT&T Corp. in Kansas City, Kan., is using Persistence in an application that controls and manages the firm's inventory of long-distance network equipment, said Randy Ringeisen, a technical staff member. But its inventory database of choice was Sybase.

While Ringeisen's group could have hand-coded the interface between the object-oriented application and the relational database, it decided to look for an off-the-shelf solution to save time. Using Persistence software saved a significant amount of time on the project, perhaps as much as 30%, he said.

US Bank of Oregon in Portland chose to solve its object-to-relational problem with Rogue Wave's DBtools.h++ class library, said Mat Henshall, a consultant working at the bank who is employed by Computer People, Inc. The bank uses Microsoft's Visual C++ to write Windows-based front-end systems for its retail branch operations, but these applications will access relational databases through an ODBC driver.

Initially, the developers at US Bank used the Microsoft Foundation Classes library to build the link, but Henshall said they found it to be fragile and error-prone.

DBtools.h++ is priced from $595; a full source code version costs roughly $2,000.

Pricing varies for Persistence, but a spokeswoman said an average installation costs about $40,000.

Getting the job done

relational data

Vendor/Product	Approach
Hewlett-Packard Co. Palo Alto, Calif. Odapter	Extends relational databases so they can store objects created by object-oriented applications.
Next Computer, Inc. Redwood City, Calif. Enterprise Objects Framework	Transforms rows in database tables into objects; developers define object classes from relational constructs.
Ontos, Inc. Burlington, Mass. Object Integration Server	Uses a shared repository to store the mappings between an object model and information in a data source. Applications use the repository at runtime to access information.
Persistence Software, Inc. San Mateo, Calif. Persistence	Maps business objects to relational databases.
Rogue Wave Software, Inc. Corvallis, Ore. DBtools.h++	Encapsulates relational constructs such as tables, rows and cursors as C++ objects with this C++ class library.

Oracle to ship warehouse database

Company offers users interim upgrade to Oracle7

By Kim S. Nash

Oracle Corp. plans to unveil this month a version of its database that has been partially redesigned to move beyond traditional transaction processing into the data warehousing market, company officials confirmed recently.

The product is part of an announcement planned for this month that will lay out Oracle's full warehousing strategy, said Steve Faris, senior director of server technologies at Oracle in Redwood Shores, Calif. The rollout would come several months behind rivals Informix Software, Inc. and Sybase, Inc., which have already launched warehousing plans and products.

Data warehouses — databases designed to hold key business information that end users can query, massage and analyze — are hot. Combined with increasingly more affordable parallel hardware that can rip through massive amounts of data, users see warehouses as more valuable cousins of yesterday's decision-support systems.

Oracle's warehouse database, which is expected to ship by year's end, has been designed according to a so-called star architecture, in broad strokes, that means user queries will be shunted directly to and from data files instead of being pumped through shared memory and buffer caches as they are in the current Oracle7 structure, Faris explained.

The ultimate goal, he added, is to offer a single Oracle database for warehousing and traditional transaction processing. Administrators would configure parts of the database for different tasks.

Star features

The star architecture Oracle is working on is similar to that of warehouse specialist Red Brick Systems in Los Gatos, Calif. Informix relies on paralleling database tasks, while Sybase plans to mix parallel technology with a patent-pending indexing and data retrieval tool called IQ Accelerator. In the meantime, Oracle has responded to user demands for more efficient warehousing features via a new release of its flagship product, Oracle7 Release 7.2.

Early users said they like what they have seen so far.

Glenn Araujo, a senior consultant at Wells Fargo Bank NA, said query processing "is a lot faster now." Though he declined to cite figures, Araujo said Oracle has paralleled certain subtasks in reading, understanding and answering end-user requests (see chart).

The San Francisco-based bank has been testing Release 7.2 for a few months and plans to put it into production in a 200G-byte data warehousing application when it receives a final version of the database, Araujo said.

Release 7.2 shipped on Sequent Computer Systems, Inc. boxes last month, with support for other multiprocessing hardware to follow this quarter and next, Faris said.

The release includes several improved features, including Secure Network Services, a set of capabilities designed to erect more barriers between hackers and corporate data. Oracle Network Manager 3.0 is also part of Release 7.2; it is an upgrade designed to let administrators graphically manage and control Oracle databases connected to one another via SQL*Net 2.0, Oracle's network protocol translator.

People are talking

A sample of observer comments reveal that early users are excited about new features in Oracle Release 7.2

On parallel tasks such as Select and Create Table:
"Queries are a lot faster."

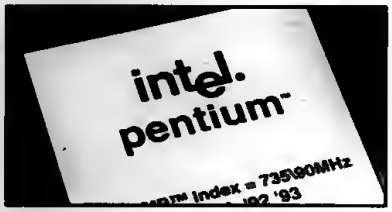
On automatically resized data files:
"Increases on-line availability of the database [because] an administrator doesn't have to resize files manually."

On enhanced security:
"We've been waiting for awhile on this."

HOW DO SAVVY COMPANIES USE ADOBE ACROBAT TO PRESERVE THEIR IMAGE ON-LINE?

Tektronix

THE DOCUMENT COMPANY
XEROX



Form **1040** Department of the Treasury–Internal Rever
U.S. Individual Income Tax
For the year Jan 1-Dec 31, 1994, or other tax
Label Your first name and initial

JPMorgan

Reuters NewMedia

TimesFax
FROM
The New York Times

It's one thing to get your corporate information on-line. It's quite another to retain the richness of your visual identity as these companies have. If your corporate identity means everything, here is the best way to preserve it on-line. **Adobe™ Acrobat™ software is simply the fastest way to publish and access rich content on-line.** The power of your corporate communications—layout, type, color and logos—is retained. Adobe Acrobat software is your guarantee that **every document you publish on-line will look like the original.** Adobe's Portable Document Format (PDF) makes information accessible on every major platform, including Macintosh,® Windows,® DOS, and UNIX.® And **you can still use your favorite applications** to create and enhance your on-line documents, with no re-authoring required. No wonder Adobe Acrobat is quickly becoming **the standard for communicating visually rich content on-line.** You'll find PDF content appearing on the World Wide Web, and virtually every other major on-line service, including America Online, CompuServe,® eWorld,® Genie,® and PRODIGY.® Join other savvy companies and preserve your image on-line. Call 1-800-521-1976, Ext. E0459 for your **free Adobe Acrobat Online Publishing Kit,** including the Adobe Acrobat CD Sampler with Acrobat Reader software, to experience PDF content first hand. If you're on-line, log on to the Adobe home page and **download our free Acrobat Reader.**

Adobe Acrobat™

Adobe

http://www.adobe.com/

Adobe, the Adobe logo, Acrobat, and the Acrobat logo are trademarks of Adobe Systems Incorporated or its subsidiaries and may be registered in certain jurisdictions. All other marks or trademarks are the property of their respective companies. ©1995 Adobe Systems Incorporated. All rights reserved.

Novadigm synchronizes client/server deployment

By Steve Moore

Mainframe shops today are running headlong into a new client/server conundrum in which developing new applications can be easier than deploying them.

As software development cycles shrink, user organizations must synchronize their development and deployment processes. A new class of object-oriented systems management tools is emerging to meet that need.

The first such tool came not from one of the established network or systems management platform providers, but from Novadigm, Inc. in Mahwah, N.J. Users and analysts have hailed Novadigm's Enterprise Desktop Manager (EDM) as the first highly scalable, object-oriented tool for enterprisewide client/server configuration management and application deployment.

Novadigm first introduced EDM in 1993. With an enhanced version of the product shipping this month, and a new plan to attract third-party software developers, the company hopes to significantly exceed last year's $10 million in annual sales.

The Novadigm Enablement Initiative aims to get developers to build software objects — called EDM Adapters — that automate interaction between EDM and third-party products. Adapters are available or in development for products from IBM, Powersoft Corp., Lotus Development Corp., Novell, Inc., Microsoft Corp. and others. Novadigm claims its object-oriented adapters will allow third parties to integrate their software more closely with EDM than they can with competing platforms that are not object-oriented.

No contest

Users praised EDM's ability to streamline application deployment.

"Given the number of sites and the diversity of platforms we wanted to get to, there really wasn't any competition out there," said Laure Dau, a technical manager at Metropolitan Life Insurance Co. in Parsippany, N.J. MetLife also considered Tivoli Systems, Inc.'s object-oriented Tivoli Management Environment but rejected it as "too beta" — or early in its maturity — compared with EDM at the time a decision was made, she added.

With nearly 20,000 desktop systems spread across 1,500 sites nationwide, MetLife needed a system capable of rapidly deploying newly written applications so that, for example, "you know the next morning that 5,000 claims processors are all on the new code," she explained.

Enterprise Desktop Manager
Novadigm, Inc., Mahwah, N.J.

Function

Enterprisewide, object-oriented client/server application deployment and configuration management.

Platforms

Central object repository and scheduling engine reside on an IBM MVS mainframe or an IBM, HP or Sun Unix system.

Distributed client and server platforms supported include Microsoft's Windows and Windows NT, Novell's NetWare, IBM's AIX, HP's HP-UX, Sun's SunOS, AT&T GIS' Unix, Macintosh, DOS and OS/2.

Pricing

$20,000 for enterprise server; clients start at $100 each.

Analysts said EDM is best suited for large organizations with extensive in-house development projects or complex sets of packaged applications.

"Novadigm is trying to break down the wall between operations and development," said Jim Herman, a vice president at Northeast Consulting Resources, Inc. in Boston. EDM is especially useful for companies that are creating their own applications on a combination of mainframes, Unix servers, Microsoft's Windows NT Servers and desktops and then "synchronizing all that and getting new features or bug fixes out quickly," he added.

More work to be done

But streamlining application deployment does not necessarily make systems administrators' lives easier.

Using EDM "is really significantly increasing workloads for me and my staff because we're doing things we weren't doing before," said Beverly Loftus, technical services supervisor at Florida Power & Light Co. in Miami. The utility is developing many client/server applications, and "without this product we wouldn't be able to get them out," she said.

Because of EDM's growing popularity, users and analysts said Novadigm is experiencing growing pains and is struggling to maintain customer support services as its user base grows. In addition, "They need to either grow some new pieces or integrate with other tools to do things like license metering and remote control," Loftus said.

Behind one of these doors is the right development tool for building high performance client/server applications.

Cozzi Research has announced Visual RPG Development System 2.0, a Windows-based development platform for IBM's AS/400.

According to the Warrenville, Ill., company, this latest release lets users drag and drop AS/400 Data Definition Specification (DDS) screen components under the Windows motif and then compile the generated DDS on the AS/400. It allows developers to use a WYSIWYG tool to edit source code and do screen layout simultaneously, which lets them view an AS/400 screen image while editing RPG code.

Visual RPG Development System 2.0 includes editing, screen layout, productivity and source code transfer features. A Screen Layout Utility is integrated with the product and is not a separate add-on. This utility is one of the first Windows-based screen design tools for native AS/400 applications.

Visual RPG Development System 2.0 costs $495.

▶ *Cozzi Research*
(708) 393-4474

Summit Software Co. has announced Summit BasicScript VBX 2.1.

According to the Jamesville, N.Y., company, Summit BasicScript VBX 2.1 is a set of custom controls for adding scripting language to Microsoft Corp.'s Visual Basic and Borland International, Inc.'s Delphi 95 application.

Summit BasicScript VBX 2.1 features an editor control, a script control and an extension control.

The editor control lets users customize applications by writing and modifying scripts. The script control lets developers organize Summit BasicScript VBX 2.1 procedures into separate scripts. The extension control lets users extend the BasicScript language with objects, methods, properties and keywords.

Summit BasicScript VBX 2.1 costs $495.

▶ *Summit Software*
(315) 445-9000

Reasoning Systems, Inc. has introduced Refine/Cobol, a re-engineering workbench for Cobol systems.

According to the Palo Alto, Calif., company, Refine/Cobol is a graphical workbench that maintains, improves and re-engineers Cobol systems. It lets users understand code structure, generate documentation, analyze changes, assess code quality and export design information to computer-aided software engineering tools.

Refine/Cobol comes with a re-engineering application programming interface for adding customized capabilities.

A Refine/Cobol license costs $11,900.

▶ *Reasoning Systems*
(415) 494-6201

Software Productivity Research, Inc. has unveiled Checkpoint 2.3, a knowledge-based tool for managing software development.

According to the Burlington, Mass., company, Checkpoint 2.3 helps users estimate project parameters such as scheduling, required effort, costs and quality. It has a template feature that lets users augment the programmed knowledge base with data from their projects.

Checkpoint 2.3 is compatible with other project management tools such as Microsoft Corp.'s Project, Applied Business Technology Corp.'s Project Workbench and Digital Toots' AutoPlan II.

Users can establish project plans in Checkpoint and then export this information into the next-step management tool.

Pricing for Checkpoint 2.3 starts at $5,000.

▶ *Software Productivity Research*
(617) 273-0140

We need an easy-to-use query tool that isn't data administration's worst nightmare!

Data rich and information poor.

It seems everyone in your organization needs access to corporate data, and each group approaches the task differently.

End users are grappling with SQL and relational data structures to generate ad hoc queries and reports.

Power users are outgrowing their specialty data access tools—tools they have found limited in analysis, presentation and integration capabilities.

Developers are bogged down building custom EIS applications for upper management.

And your IS department, struggling to support all of these products, is losing control of who accesses data.

You need a single solution that is simple yet powerful, both intuitive and feature-rich and customizable as well as controllable.

You need Q+E.

INTERSOLV Q+E Version 6.0 is the end user's connection to client/server data. Q+E's intuitive query interface and data warehousing functionality mask the complexities of relational data and reduce your training and support burden.

Q+E empowers end users.

By empowering end users, Q+E allows your developers and IS staff to concentrate on mission-critical projects. And with Q+E's flexible interface, you can support the needs of different users and preserve data integrity and system resources.

No complicated or time-consuming setup and administration is required. Just install it and your end users can begin converting data into meaningful information immediately.

Try the new version of Q+E. It's better than ever. It's a query tool, report writer, EIS tool, data warehousing solution and more—all in one.

Call today for a free copy of our white paper, "Q+E: The End User's Connection to Client/Server Data."

Don't delay! Call today!
800-876-3101
Ext. QE17

Q+E supports ALLBASE, Btrieve, Clipper, DB2, DB2/2, DB2/6000, dBASE, Excel, FoxBase, FoxPro, Gupta SQLBase, IMAGE/SQL, INFORMIX, INGRES, Microsoft SQL Server, NetWare SQL, Oracle, Paradox, PROGRESS, SQL/400, SQL/DS, Sybase System 10, Sybase SQL Server 4, Teradata, text files, and XDB

INTERSOLV
one stop for scalable client/server development

INTERSOLV Q+E is the Answer!
The End User's Connection to Client/Server Data

© 1994 INTERSOLV, Inc. All rights reserved. INTERSOLV, Application Maintenance Workbench, PVCS and Q+E are registered trademarks and APS and Datalinkert are trademarks of INTERSOLV, Inc. Other company or product names mentioned herein may be trademarks or registered trademarks of their respective companies.

DENVER & COLORADO SPRINGS CAREERS
WILL BE FEATURED IN COMPUTERWORLD'S JUNE 12 WESTERN EDITION.
DEADLINE: JUNE 8, 3PM
1-800-343-6474, x173

Singapore Airlines moves into intelligent systems

By Tong Ying

Singapore Airlines is turning to an artificial intelligence-based system that will manage the company's flight crew scheduling and handle disruptions to the crew rosters.

The project, called the Integrated Crew Management System (ICMS), is scheduled to be implemented in stages during the next two years and is being developed by ICL's Airlines Group. ICMS consists of three modules — a roster assignment module for cockpit crew and one for the cabin crew and a crew tracking module. The core components of the system are written in C and interface to Oracle Corp.'s database. It will run on Unix servers, be based on a client/server architecture and interface with the airline's main corporate mainframe systems.

"The first two modules will automate the tracking and scheduling of the flight crew's timetable," said Philip Watson, project manager of ICL's Airlines Group.

The Cockpit Crew Roster System will be implemented at the end of the year, while the Cabin Crew Roster System is expected to go live sometime early next year.

"With this system, the crew schedulers will have access to a powerful [graphical user interface] to manage crew rosters more effectively than the existing system," Watson said.

Singapore Airlines has an extensive network of destinations and aircraft, which include the following:

- **Route network:** 71 cities, 40 countries.
- **Aircraft fleet:** 31 B747-400, 13 B747-200/300, 23 A310-200/300 and 1 B737-300.
- **Crew strength:** 1,150 cockpit crew, 5,300 cabin crew.

The third module will track the positions of the crew and include an intelligent system that handles crew pattern disruptions.

For example, crews will need to be rearranged if one member falls ill while in a foreign port. "The system has to work out where a backup can be found in order to prevent understaffing on the scheduled flight," said Matthew Johnson, software designer on the team of developers for the Singapore Airlines system.

"As a result, people would be switched from the crew team, which might be scheduled for a later flight," Johnson said. "The intelligent system will then check from its crew roster and database to determine the best way to reschedule the different crew members' rosters to accommodate the sick person. Should the need arise, another person will be flown in from the base port to replace the absent crew until he or she recovers."

This crew disruption handling module will be integrated with the crew tracking system. It will provide decision-support capabilities in real time, according to Lim Cheng Wee, crew systems manager at Singapore Airlines' flight operations division.

"It is believed that currently no other airline has such a system in operation," Watson said. Usually, a system such as this costs between $1.1 million to $4.3 million, depending on the airline's requirements, he added.

Ying writes for *Computerworld Singapore*.

From experience

Normally, when the airline receives disruptive news such as flight delays or crew unavailability, the crew control department makes a decision based on its experience.

But ICL's intelligent flight disruption handling system gathers the expertise of experienced professionals and stores this knowledge in a computer database instead.

If a potentially disruptive situation occurs, the intelligent system automatically draws upon the knowledge stored in the database and advises the best course of action. This might mean repositioning the crew or calling in backup staff.

"Basically, intelligent systems are powerful due to their ability to mimic human nature and the learning process," said Philip Treleaven a professor at the University College of London.

Sorry, SQL-based tools can lead to dead ends.

Sorry, RPC-based tools have definite limitations.

FOUNDATION™ for COOPERATIVE PROCESSING

FOUNDATION™

Take the open road with FCP.

For developing large, enterprise-wide client/server applications, the message-based architecture of FCP opens new doors of performance and reliability.

FCP protects developers from the complexities of large systems, and is compatible with most popular platforms, including IBM's AIX, OS/2 and CICS, Microsoft's Windows and Windows NT, Digital's OSF/1, Sun's Solaris, and Hewlett Packard's HP/UX.

Ask for FCP product literature or any of our white papers on repository, prototyping or message-based architecture by calling **1-800-458-8851** or faxing your request to **1-312-507-0802**. Outside the U.S. call **1-312-507-6784**.

Choose FOUNDATION

ANDERSEN CONSULTING

FOUNDATION is a registered trademark of Andersen Consulting. All other trademarks and service marks are properties of their respective owners. ©1995 Andersen Consulting. Arthur Andersen & Co., S.C. All rights reserved.

Power supply and fan covered by five year on-site warranty only HP 10/100VG adapters
Microsoft is a registered U.S. trademark and
Corporation © 1995 Hewlett-Packard Company RN0019

"Four years ago, **HP** *invented the stackable 10Base-T hub. But when you look at the* **POWER** *of* **100VG** *today, it seems more like forty."*

Dave Tostenson
Senior Engineer
HP Networks Lab

As fast as technology changes these days, it's easy to lose track of the latest innovations. One thing to keep in mind, though, is that your need for network speed is only going to increase, especially with multimedia, video and graphics becoming routine on the LAN.

That's why we're so excited about HP 100VG. Our HP AdvanceStack hubs and HP 10/100VG adapter cards work together to deliver breathtaking performance to every node on the network. Great news for end users and LAN managers alike. What's more, HP 100VG supports major topologies, cabling and connectors. So your existing investment is protected. And speaking of investments, we've made sure HP 100VG is cost-effective, at just $470* per seat.

Call us today at 1-800-533-1333†, Ext. 9459, and get more information on HP 100VG. You'll see why, here in the labs, we think it's simply a case of history repeating itself.

HP Networking
We've been there all along.

100VG-AnyLAN technology does more than speed up your LAN • Solves bandwidth problems • Maximizes throughput • Supports multimedia

Fits in your existing Ethernet network with little or no re-investment • Preserves existing cabling (including UTP CAT 3,4,5), and all existing 10Base-T network topologies
• Works with major NOSes (NetWare, Microsoft® LAN Manager, Windows™ for Workgroups, Windows NT, etc.)
• Supports IEEE 802.3 Ethernet frame types

Priced to implement now*

$3 549	HP AdvanceStack 100VG Hub-15
$229	HP 10/100VG Selectable ISA LAN adapters
$349	HP 10/100VG Selectable EISA LAN adapters
$249	HP 10/100VG Selectable PCI LAN adapters
$1,399	HP 100VG SNMP/Bridge module

HEWLETT® PACKARD

Inside
INTELLIGENCE FILES, *page 88*
CALENDAR, *page 93*

Smarten up!

'Knowledge management' may offer new hope for IS. But making it work is hardly a no-brainer. BY JOSEPH MAGLITTA

What is knowledge?

Data is raw numbers and facts.

Information is processed data.

Knowledge is information made actionable.

STORY LINE:

GM, Fidelity, Monsanto, and other leading companies are learning how to tap their own brain power. Organizational and technical hurdles may cripple the knowledge management movement, but if this trend pays off, backers say IS can look forward to building innovative applications and attaining a new corporate role.

BRIAN RAUCH

Want a future in information systems? A growing flock of big companies, consultants and academicians (including demigod Peter F. Drucker) say that managing "knowledge" could help many IS groups change their image from turkey to owl.

"A lot of the value of the corporation is in the minds of employees," says Leif Edvinsson, Skandia Group Insurance Corp.'s first director of intellectual capital in Stockholm. Corporate knowledge, skills, experience and business processes, as well as information stores and systems, become more valuable when shared via global networks, he says.

And boosters of "knowledge management" say that helping companies turn gray matter into greenbacks should be the next frontier for beleaguered IS pros. Supporters assert that becoming "chief knowl-

edge officers" or managers could help some IS groups gain or regain organizational stature.

"If they don't do this," warns Laurence Prusak, an Ernst & Young consultant in Boston and major promoter of the concept, "IS will become the sort of people who do the back-office integration of the telephone."

> "If they don't do this, IS will become the sort of people who do the back-office integration of the telephone."
>
> – **Laurence Prusak**
> Ernst & Young

Scare tactics? Trend of the Month? Before you reject the idea, consider: General Motors Corp., Fidelity, Inc., Ford Motor Co., Monsanto Corp., Dow Chemical Corp., Hallmark, G. E. Lighting, Hewlett-Packard Co., AT&T Corp., IBM and a growing number of other leading firms are taking the infant discipline of knowledge management very seriously. Each is working to improve how they acquire, share and use knowledge in their organizations. In each case, IS plays a key leadership or support role.

The basic idea is this: Companies must gather, cultivate and manage intellectual capital as carefully as they do financial capital. Leverage knowledge, the thinking goes, and you can reduce time to market, cut research and development costs and boost productivity.

But that can only happen if a company's intellectual assets — for information, know-how and understanding about customers, competitors, markets, processes and people — is freed from the computers, brains, libraries and file cabinets where it's now trapped.

That's where IS comes in, Prusak says. He and colleagues Christopher Gopal and Thomas H. Davenport, a University of Texas professor and Ernst & Young fellow, says IS's systemic thinking, technology know-how and experience working with many departments can be the perfect background for knowledge management.

Visions vary, but most agree that duties include the following:

- Mapping knowledge and information resources both on-line and off-line.
- Serving as a "knowledge champion" who obtains funding and sets policies.
- Training, guiding and equipping users with knowledge access tools.
- Building "knowledge networks" and "knowledge infrastructures."
- Monitoring outside news and information.

It's more than theory. Take Stockholm-based Skandia Corp., a multinational financial services and insurance company.

Four years ago, Skandia used its knowledge about how to set up and manage its offices to create a system that slashes the time needed to create a branch office from 24 months to six. The prototype contains all the information, business processes and technology required to open and run an office.

Today, sister company American Skandia continues to roll out a sophisticated broker support system called Assess (see box below).

Four years ago, General Motors began looking at new ways to ensure that new models reflected what buyers wanted, says Vincent Barabba, GM's CIO and knowledge guru based in Warren, Mich.

"If you spend $500 million to develop and introduce a new vehicle only to find out it doesn't meet customer requirements, that's a very expensive lesson," Barabba says.

So starting with the 1993 Chevrolet Camaro and Pontiac Firebird models, GM began seeking ways to provide engineers and designers with as much high quality intelligence on buyers as possible. A major goal: get cars out the door quickly, before buying tastes changed.

Among other things, GM created a dynamic computer model that simulates customer reactions to various vehicle concepts and alternatives.

Barabba credits the huge success of the Chevy Blazer and GMC Jimmy in part to the application of underused knowledge about customers' buying habits. Ultimately, he says, better management and use of knowledge have helped GM avoid costly mistakes.

"If you sat down with a vehicle program team just

Smarten up!, *page 86*

In the know

These companies are experimenting with knowledge management

★ **Skandia Corp.** Few have tackled knowledge management and measurement as zealously as Skandia Corp. The global insurance firm is expanding its Notes-based "knowledge bases" beyond Europe and the U.S. into Mexico, Colombia and Tokyo, says Christopher Luise, vice president of system management/research and development at American Skandia in Shelton, Conn. The American sister company's information services and technology group also measures computer literacy and usage by employees. Skandia's new Assess software gives more than 7,000 brokers detailed knowledge of investment options and asset allocations. It also assists in sales and client proposals.

★ **Northeast Utilities Co.** Earlier this year the Hartford, Conn.-based electric company created a "Central Information Group" to identify, categorize and share knowledge across the organization, says finance manager and group member Bud Eckenroth. The group includes representatives from IS, accounting, human resources, treasury and others.

★ **Fidelity, Inc.** The Boston-based giant's brokerage group has formed a 20-member volunteer team "looking at ways to use information and learning," says Vice President Bill Nigreen. The "Kaizen Learning Network" grew from corporate total quality efforts and includes representatives from every major department. Nigreen says it has already produced benchmarking databases for internal and external use, a draft "information architecture" and a Notes-based communications vehicle about the project called "Fidelity Facts."

Knowledge basics

Q: What exactly is knowledge management?

A: It's the emerging discipline of systematically and actively managing and leveraging the vast stores of knowledge and information that exist in a typical company. "Knowledge" refers to systems, processes and know-how.

Q: Why are companies doing it?

A: Reasons differ. But in general, they're trying to take advantage of untapped, unconnected expertise to speed production, boost sales, improve customer service, etc.

Q: How does it affect IS?

A: Depending on the organization and culture, technology groups lead knowledge management efforts or play an integral role as enabler. Some backers say knowledge management offers a promising, natural next stage of evolution for many IS groups.

Q: Sounds like another buzzword. Is it for real?

A: Yes. Growing numbers in business and academia say knowledge management will become increasingly important as corporations continue to flatten and the economy shifts toward information-based businesses.

Q: Are any real companies doing it?

A: Yes, dozens of large corporations around the world. They include General Motors, AT&T, IBM, Dow Chemical, Skandia and Fidelity. Interest seems to be rising rapidly.

Smarten up!

CONTINUED FROM PAGE 85

starting a product launch today, you'd find they are provided with significantly more understanding on how to meet customer requirements and get to market faster than two years ago," Barabba says. Whether the concept proves salvific or scrap-worthy remains to be seen.

But the current corporate interest is no passing fad, says Harvard Business School professor Christopher A. Bartlett. He says it's part of the quickening switch from an industrial-based to an information-based economy.

"Knowledge is now the center of the company. It is needed to free the creativity and initiative of frontline managers and regiments," Bartlett says.

Why now? Companies have fewer people, more technology and more information, Davenport notes. Rapid growth of groupware and networks are big factors. So is widespread business process re-engineering.

Interest is growing. McKinsey & Co., Andersen Consulting, Price Waterhouse, Gemini Consulting and other big consultancies are developing knowledge management expertise internally and with clients.

> "Knowledge is now the center of the company. It is needed to free the creativity and initiative of frontline managers and regiments."
>
> – **Christopher A. Bartlett**
> Harvard Business School

Ernst & Young recently started a Knowledge Management Practice and opened a Center for Business Knowledge in Cleveland last year. Two dozen major U.S. corporations have joined its new research consortium on the topic.

Moreover, some 200 top executives jammed a Planning Forum/Ernst & Young conference on knowledge in Boston last fall. Another is set for November.

Interest is worldwide: Kao, the Japanese soap and detergent giant, is a pioneer manager of knowledge. "The Japanese Procter & Gamble" is noted for savvy use of expert systems and open decision-making.

For most firms, it's too early to tell how well knowledge management efforts will pay off. Measurement is difficult. Robert R. Walker, HP's director of information systems, says creating extensive on-line knowledge maps and delivery systems has helped improve access and slash costs. "Forty percent of the occupancy cost of one organization was paper storage," he told attendees at the Knowledge Advantage conference.

Other questions loom: Will companies already reluctant to fund employee training be willing to pay for them to learn knowledge management?

Like re-engineering, knowledge management will be embraced by some, delayed or even ignored by others. Time will tell who's smartest. ■

Maglitta is *Computerworld*'s senior editor, Corporate Strategies. *Computerworld* research analyst Laura Hunt contributed to this report.

Acknowledging the difficulties

Despite their enthusiasm, IS leaders and consultants caution that implementing knowledge management will be tough. Among the major problems:

• New mind-set for IS. University of Texas professor Thomas H. Davenport says companies must "begin by thinking about how people use information, not how people use machines." That enormous change would boggle many IS groups, many of whom Davenport says are tempted to deliver a "knee-jerk technology response."

Jane C. Linder, senior manager at Polaroid Corp.'s New Business Concepts Center, agrees that IS must stretch to succeed in the role. "Information providers — even if they care about content — often feel their job is done when they provide access [to information]," she says. But more is needed to make information usable or useful, she says.

• New skills. Speedy delivery and analysis of knowledge requires mastery of many new tools and techniques, say experienced chief information officers. Among those tools and techniques are Notes or other groupware, rapid and joint application development, object-oriented programming, "scrubber" software to improve data quality, middleware for accessing legacy databases, search engines, data warehousing and enterprise reference systems.

Moreover, heavy communications and infrastructure experience is needed to support complex knowledge delivery systems that increasingly include images, video and voice. Leadership and decision-making skills also are key.

One snag in learning knowledge management, says Gary Banks, director of Monsanto Corp.'s center of technical excellence, is that "there's no place to get trained."

• Skepticism about "CKOs." Many wonder if the title chief knowledge officer will fly. Says Bruce Rogow, an independent consultant and Gartner Group fellow in Marblehead, Mass.: "If the CIO stands up one more time and says, 'I am the chief *anything* officer,' [people] are going to be saying, 'You're the chief B.S. officer.'"

Some CIOs, including Craig D. Goldman of The Chase Manhattan Bank NA and Michael Radcliffe of Owens-Corning Fiberglas Corp., say they already serve as de facto CKOs. They question if a new title is needed. "Information is our lifeblood," Goldman says.

Moreover, Harvard Business School professor Christopher A. Bartlett says he worries that creating a CKO might give line managers the erroneous — and dangerous — belief that knowledge is not their concern.

And many IS groups lack the clout needed to assume the role, Linder says. "It will take some concerted effort on the part of MIS and business to change that," she says.

• Huge scope. Consider Monsanto Corp. Its new 20-member Knowledge Management Architecture team faces a Herculean task, says Bipin Junnarkar, director of the 3-month-old effort. "We must understand the business and information needs of 15 strategic business units 2½ years from now," he says.

The St. Louis-based manufacturer will look at everything from internal accounting data and point-of-sale data to information on distributors, regulations and joint ventures. Filtering such mountains of information is an "overwhelming" task, Banks says. Their solution, Junnarkar says: "Take one bit at a time."

• Internal politics. Like re-engineering, knowledge management programs need clear support from the chief executive officer to get started. But many employees equate information and knowledge with power and won't readily share or contribute, warns Hugh Ryan, managing partner in Andersen Consulting's New Age Architecture group.

"Some companies have talked about paying for information, but that's a slippery slope that causes lots of problems," he says.

Adds Ernst & Young consultant Laurence Prusak: "IS often tends to overlook the irrational, the ambiguous nature of human beings and organizations. They tend to think of human beings as binary. They think: 'We've got Notes, so everyone's going to talk to each other.'"

• Heavy maintenance. Anyone with Notes experience knows that even a single discussion database can quickly become a tangled, unusable thicket. "Be prepared to invest a lot of energy on the quality of information," Goldman warns.

To cope, Andersen Consulting, Buckman Laboratories and others have created positions for "knowledge managers" responsible for knowledge base quality and content.

Resources

- "Saving IT's Soul: Human Centered Information Management"
  Thomas H. Davenport
  Harvard Business Review
  March-April 1994
  (617) 495-6985

- **The Knowledge Advantage Conference**
  Chicago, Nov. 16-17
  (617) 725-1541

- **Conference on Information and Knowledge Management**
  Baltimore, Nov. 29-Dec. 2
  (410) 455-2594

- "Intellectual Capital: New Ways to Build It and Manage It"
  Fortune,
  Oct. 3, 1994

- *The Information Mosaic*
  Sharon M. McKinnon and William J. Bruns Jr. ($24.95)
  (617) 495-6117

- *Future Work: Putting Knowledge to Work*
  Charles D. Winslow, William L. Bramer ($29.95)
  (800) 223-2336

It's about expanding boundaries, broadening capabilities, and controlling your destiny.

BOUNDARY ROUTING KEEPS YOUR REMOTE OFFICES WITHIN REACH.

And it will help your business evolve in any direction you want. Because now your branch offices can have direct access to the corporate network. They'll have sales figures, e-mail, or other information as easily as the central office does. And you won't be stretched to the limit trying to support them. No extra service is required, because with Boundary Routing® system architecture everything is controlled and managed from the central site.

It's all part of 3Com's SuperStack™ system and the NETBuilder® Remote Office family of routers, offering the most extensive range of stackable solutions available. And taking your network wherever you want it to go. Call 1-800-NET-3Com for more information.

3Com®

NETWORKS THAT GO THE DISTANCE

© 1995 3Com Corp. (408) 764-5000. 3Com, Boundary Routing, SuperStack, NETBuilder and Networks That Go the Distance are trademarks of 3Com Corp. To learn more visit 3Com's worldwide web site at http://www.3Com.com

Intelligence Files

They'll communicate with everyone, but they won't talk to you

THE CORPORATE COMMUNICATIONS FUNCTION — the department that gets out the company message to employees (and the press) — has a love affair with information technology. Electronic mail will soon surpass the copy machine as the most widely used technology for communicating with the corporate masses. Bulletin boards, video- and teleconferencing and fax aren't very far behind.

But there's one group to whom corporate communicators have little to say: information systems.

Can't say enough about technology

Most corporate communications managers agree on the need to use and upgrade technology

Percentage who say technology:

Is vital to employee communications	90%
Must be upgraded	90%
Has improved efficiency and productivity	81%
Is a high priority	80%
Upgrades should be managed by communicators	78%

Base: 100 corporate communications managers at Fortune 100 companies. Survey by Cognitive Communications, Inc., Stamford, Conn.

That may come as a surprise, considering that the majority of Fortune 100 corporate communications managers say they want to be involved in any upgrades in communications technology and that they see themselves as the strategic information managers. And even though 90% of corporate communicators say technology and employee communications are vitally linked, 80% say they have no formal ties to IS.

Those are among the findings of a recent study of nearly 100 employee communications vice presidents, directors, managers and supervisors at primarily Fortune 100 companies. The study was sponsored by Cognitive Communications, Inc. in Stamford, Conn.

The study also found that while nearly 60% of corporate communications is in print form, the communicators say they expect to be using electronic and print media equally for all internal communications within three years. That is because they say electronic means can reach more employees more quickly and at reduced cost.

"Employee communicators believe information distributed electronically will be the norm" before the beginning of the next century, says Michael Rudnick, a partner at Cognitive Communications. "This is a remarkable prediction, given the fact that the employee communicators surveyed said they used electronic media for just 10% of their communications just three years ago."

Meanwhile, the survey found that when it comes to chewing the fat with co-workers, the PC has replaced the water cooler as the most popular place to share information and dialogue.

Employees now use a dozen technologies to speak to one another, with electronic mail by far the most popular. Nearly 90% of the companies surveyed say E-mail is their most commonly used form of person-to-person communication, and 54% use E-mail to post messages to on-line bulletin boards.

"Can we E-mail?"

Leading companies say E-mail is their most commonly used employee communications tool

Percentage that say they use the following:

E-mail (person-to-person)	88%
Print materials	75%
E-mail (top-down publishing)	68%
E-mail bulletin boards	53%
Videoconferencing	52%
Teleconferencing	51%
Broadcast voice mail	50%

Base: 100 corporate communications managers at Fortune 100 companies. Survey by Cognitive Communications, Inc., Stamford, Conn.

Information systems should be a follower when it comes to application development

The best way to give users what they need from new applications development is to let them show you, according to a new report from Forrester Research, Inc., a consultancy in Cambridge, Mass.

In "New Media Tools," Forrester says that in order to create the customer-oriented applications that users require, IS must take a back seat in application development to user teams that consist of members from other departments and nontechnical backgrounds.

Key to this effort is the connection between the IS and marketing departments, an alliance that has been rare in most companies. Pure technologists must work with content specialists, graphic artists, videographers and others to create applications that grab and keep customers. This collaborative approach has been virtually nonexistent in most companies.

Want career success? Put family first, study says

Information systems professionals who want a bigger paycheck may want to pay more attention to their home life.

That is the finding of a new national study by the University of Pennsylvania's Wharton Business School that says professional workers who earlier in life ranked a good marriage and raising a family as their top goals tend to have higher salaries later in their careers.

The findings were published recently in a Wharton monograph titled "It Pays to Value Family: Work and Family Trade-offs Reconsidered."

Respondents were first surveyed as high school seniors and again after 14 years in the workforce. Those who had initially rated a strong family life as a major goal were found to enjoy higher hourly earnings than those who didn't — 7% more for men and 4% more for women. And those who specifically ranked career-oriented goals such as success at work, having a lot of money and finding a steady job as most important earned less than the average participant.

The study notes that economists have long wondered why married men earn better salaries than their unmarried counterparts. The Wharton study suggests that the willingness to make a strong commitment to marriage or family carry over to the workplace.

In addition, the emotional support from a spouse or family helps employees better cope with job-related problems or stress.

IS Managers' Bookshelf

TQM for Information Systems Management
By James W. Cortada
This thorough and practical guide by an IBM consultant brings total quality management down to earth for IS managers, from supporting business strategies to applications development, IS operations and personnel practices. (McGraw-Hill, Inc., New York; 301 pages, $29.95)

Information Systems Position Description HandiGuide
By M. Victor Janulaitis
At $395, it isn't cheap, but this consultant's newly revised guidebook provides standard job descriptions of traditional (but not unconventional) IS positions. (Positive Support Review, Santa Monica, Calif.; 445 pages, $395)

Hook Up, Get Hired!
The Internet Job Search Revolution
By Joyce Lain Kennedy
The Internet is the new way to find jobs. Kennedy shows where the jobs (including technical ones) are posted and how to get your resume noticed on the 'net. (John Wiley & Sons, New York; 250 pages, $12.95)

Say It and Live It: The 50 Corporate Mission Statements That Hit the Mark
By Patricia Jones and Larry Kahaner
This guide is not IS-specific but is useful if you must write a mission statement for your department. (Currency/Doubleday, New York; 267 pages, $14.95)

How Frito-Lay Handles the Decision Making CRUNCH

Doritos® and Tostitos brand Tortilla Chips, Lay's® and Ruffles® brand Potato Chips, and Rold Gold brand Pretzels

It's hard to imagine any company that understands consumer tastes better than Frito-Lay, a leader in the U.S. salty snack category with annual revenues of more than $5 billion. Yet Frito-Lay is determined to get even closer to its 400,000 retail customers.

In fact, a decentralization effort begun in 1990 has, in the last five years, brought a renewed sense of ownership and empowerment to the 30,000 Frito-Lay employees. As part of this ownership, Frito-Lay's Information/Technology Systems department (I/TS) has created a tactical, market-driven decision support system—the Zone Workbench System—designed to get timely information in the hands of front-line managers.

It's an application built from the customer up, and the SAS® System of software has been there every step of the way.

"The Zone Manager is the first line of communication with our Route Sales force," says Tom Nealon, Director of I/TS for Frito-Lay, whose department spearheaded development of the decision support system. "We knew from the start that the Zone Workbench had to provide information that was 'actionable'. It also had to be portable across client/server, workstation, or laptop environments. Equally important was the ability to integrate multiple data sources."

Delivering More than Software Alone

"Given the tight schedule, the software company we chose had to provide superior applications development tools—as well as comprehensive training, consulting services, and documentation," adds Nealon. "SAS Institute came through on every count, proving time and again the value of having a software vendor that's as interested as we are in completing projects on time and on target."

Nealon calls the Zone Workbench "a tremendously versatile business tool proving user-friendliness, power, and portability between platforms can all operate in one package. The old-style EIS systems are antiques. The game today is to provide information that can impact the marketplace each day, for each of our customers. For Frito-Lay, SAS Institute is making sure we have the tools to make an impact."

To receive a SAS System Executive Summary, give us a call or send us e-mail at ewosas.sas.com

SAS®

SAS Institute Inc.
Phone 919-677-8200
Fax 919-677-4444
www: http://www.sas.com/
In Canada: 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc.
Copyright © 1995 by SAS Institute Inc

YOU WRESTLE

WITH NETWORK INTEGRATION.

YOU GRAPPLE

WITH HOST CONNECTIVITY AND MESSAGING.

OU TUSSLE

ITH FILE AND DATABASE

MANAGEMENT.

YOU

EXHAUSTED.

Take heart. There's a new, integrated family of server software called Microsoft BackOffice. And it will empower you to do your job. With authority.

Imagine what you could do with an integrated information system.

You could finally break free of clumsy business systems. You could respond more quickly to changing business needs. You could enable the people you work with to get the information they need. So they can make better, smarter decisions.

It's called Microsoft® BackOffice. And it's a whole new approach to business computing. Five best-of-breed products that combine to form an integrated information system. One complete, seamless client-server network based on Windows NT™ architecture that will enable you to create the next generation of information applications. At last.

You start with the network operating system–Windows NT Server. After that, it's easy to add database management (Microsoft SQL Server™), messaging (Microsoft Mail Server), host connectivity (Microsoft SNA Server), and systems management (Microsoft Systems Management Server). You can forget struggling for days to get things up and running, because everything is optimized to work with Windows NT Server, and everything is designed to work together.

Microsoft Windows NT Server: *The network foundation for a new generation of business applications. It is a multipurpose network operating system that can deliver application server capabilities without compromising file and print service performance*

Microsoft SQL Server: *The high-end database platform at the center of a complete client-server architecture for information management.*

Microsoft SNA Server: *Makes it easy to connect PCs to IBM mainframes and AS/400s.*

Microsoft Mail Server: *The heart of a complete messaging system that makes it easy to communicate with anyone, anywhere.*

Microsoft Systems Management Server: *The most comprehensive solution for managing networked PCs*

Client License Pak: *BackOffice family licensing simplifies client-server pricing. The client license pak includes one Client Access License for each BackOffice server product you acquire, essentially licensing a single desktop to access those products on any server*

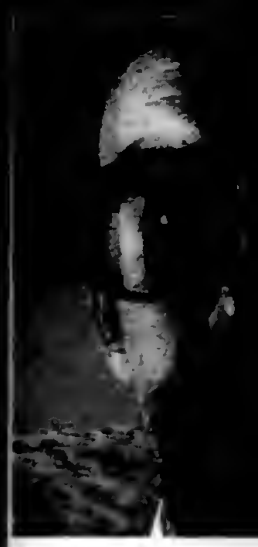
You can forget struggling with a jumble of tools and incompatible interfaces, too. With Windows® architecture on both the client *and* the server, you'll use a consistent, graphical set of tools to develop and manage applications across all products. And easily tie corporate information to the desktop.

Now about money. And choice. Explain to your boss that an open platform means the power to extend your existing network, *including* NetWare,® Macintosh® and UNIX.® Mention that it runs on standard, leading hardware, which lowers the cost of purchase and operation. And that there are over one thousand 32-bit applications for the Windows operating system and tens of thousands of 16-bit Windows-based applications at your disposal. Which makes the BackOffice family a sound investment.

Call (800) 709-3783, Dept. 3GC to learn more. Or contact us at "GO BIZSOLN" on CompuServe.® You can revolutionize the way people in your company use and share information. You can make the decisions that make your business run better. It's all within your reach.

Microsoft

WHERE DO YOU WANT TO GO TODAY?™



"SNOW, SURF OR WILDERNESS, OUR GROWING LINE OF SPORTS VEHICLES CAN GO ANYWHERE. WE NEED AN INFORMATION SYSTEM THAT CAN KEEP UP."

Bryce D. Abrahamson, Vice President, ARCTCO, INC.

BRYCE: "Our Arctic Cat snowmobiles and Tiger Shark watercraft keep us moving year round. Soon, we'll have an all-terrain vehicle. Our growth is changing the way our business operates. When Ray said our information system had to change with it, I saw only giant moguls ahead."

RAY: "With Btrieve 6, we changed to client/server and had it running throughout the company in record time – without a hitch. Btrieve allows us to program in a familiar environment with a model we know works."

BUILTON BTRIEVE

BRYCE: "New information systems have a reputation for requiring more: more time, more people, more money. Ours proved just the opposite."

RAY: "We've kept our staff lean and cut training time. We've reduced response time to two seconds and the time it takes to produce MRPs has been cut in half. Thanks to Btrieve, we are molding our system to meet our growing company's needs."

To receive the complete Arctco story, call Btrieve Technologies, winner of the 1995 RealWare Award at DB/Expo. 800-BTRIEVE, or (512) 794-1719, CompuServe [GO BTRIEVE].

IT SIMPLY WORKS

BTRIEVE TECHNOLOGIES

Winner REAL

"OUR GROWTH DEMANDS CLIENT/SERVER TECHNOLOGY. BTRIEVE GOT US THERE SMOOTHLY AND ON SCHEDULE."

Raymond Koukari, Jr., IS Director, ARCTCO, INC.

Calendar

JUNE 25 - JULY 21

MANAGEMENT

Achieving Excellence in MIS Through Total Quality Management (TQM). Washington, June 26-28 — A three-day seminar on how to implement a TQM program in the IS function. Fees: $1,395 for American Management Assocation (AMA) members, $1,605 for nonmembers. Contact: AMA, New York, N.Y. (800) 262-9699.

Channels for Change: International Network of Women in Technology Conference. Santa Clara, Calif., June 27-29 — Theme: "Channels for Change: a Celebration of Women in Technology." Keynote speaker will be feminist leader Gloria Steinem. Contact: International Network of Women in Technology, Sherman Oaks, Calif. (818) 990-1987.

Central Region Data Administration Management Association (DAMA) International Symposium. Milwaukee, July 10-11 — Theme: "Refocusing Data Administration." Cosponsored by DAMA Milwaukee Chapter and DAMA International. Speakers will include Jim Sinur of Gartner Group, Inc. and Larry English of Information Impact International. Contact: Ellen Munroe, DAMA, Milwaukee, Wis. (414) 783-1726.

The MIT Executive Short Course for Chief Network Officers. Cambridge, Mass., July 10-14 — Theme: "Managing the Information Technology Network for Global Competitiveness." Course focuses on the strategic role of telecommunications in global organizations and managerial and technical challenges the chief network officer faces in building and managing a network infrastructure. Contact: Executive Education Short Courses, MIT Sloan School of Management, Cambridge, Mass. (617) 253-7166.

USER GROUPS

Second Annual Southern California Technical Conference for Midrange Computer Professionals. Costa Mesa, Calif., July 20-21 — Sponsored by the Ocean User Group of AS/400 users. Fee: $325. Contact: Ocean User Group, Corona Del Mar, Calif. (714) 751-5100.

TECHNOLOGIES

Third Annual International Environmental Visualization Exposition. Research Triangle Park, N.C., June 26-28 — Focus will be on computer graphics education programs and computer graphics as a diagnostic tool for environmental science research. Contact: Kerstin Felske, Lockheed Martin, Bay City, Mich. (517) 894-7699.

The Association for Work Process Improvement's 1995 Forum & Exposition. Fort Lauderdale, Fla., July 9-12 — Theme: "Transaction Processing Application Solutions: The User's Perspective." Alan J. Parisse will deliver the keynote address on "Managing Cycles and Change." Contact: Linda Cooper, executive director, The Association for Work Process Improvement, Boston, Mass. (617) 426-1167.

INDUSTRIES

The Fifth Annual Healthcare Information Systems Conference & Expo. Washington, June 25-28 — Focus will be on the latest developments in IS for patient care, managed care, systems integration, point-of-care, telemedicine and community and enterprise health information networks. Contact: Inside Healthcare Computing, Oxnard, Calif. (805) 984-8500.

On Demand Digital Printing & Publishing Strategy Conference & Exposition. New York, June 27-29 — Focus will be on the latest developments in digital printing and publishing, targeting commercial printers, publishers, service bureaus and outsourcing firms. Contact: John V. Gobez, Expocon Management Associates, Inc., Fairfield, Conn. (203) 256-4700.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

SEND ANNOUNCEMENTS TO

David Weldon, Associate Editor/Management, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931.

It takes guts to build the perfect line printer.

The 4800 Series from GENICOM. Nonstop reliability that costs less to own.

Lowest cost-of-ownership of any printer in its class.

Patented shuttle mechanism and striker bar carries the industry's only lifetime warranty.

Patented, lower-cost, clean-hands ribbon.

Quick performance at 400 or 800 lpm and no preventive maintenance.

Ideal for bar codes, labels, multipart forms, industrial graphics, high-volume reports, mail processing, card stock and more.

Dependability worth looking into. Inside our gutsy performers, you'll find few moving parts. And that means trouble-free printing. The 4800 Series is the perfect choice for the warehouse or the office.

The 4800 Series puts more on the line. Popular emulations are standard in the 4800 Series. IBM coax and twinax models are available, as are connectivity solutions for Ethernet, TCP/IP and Token Ring LANs.

Put it all together with GENICOM. There's a GENICOM document solution for every workload and every workgroup. All backed by GENICOM's worldwide, quick response service network. For more information and a free copy of **The Complete Guide To GENICOM Printing Solutions**, call **1-800-GENICOM Dept. 150.** In Canada, call 1-800-268-0464.

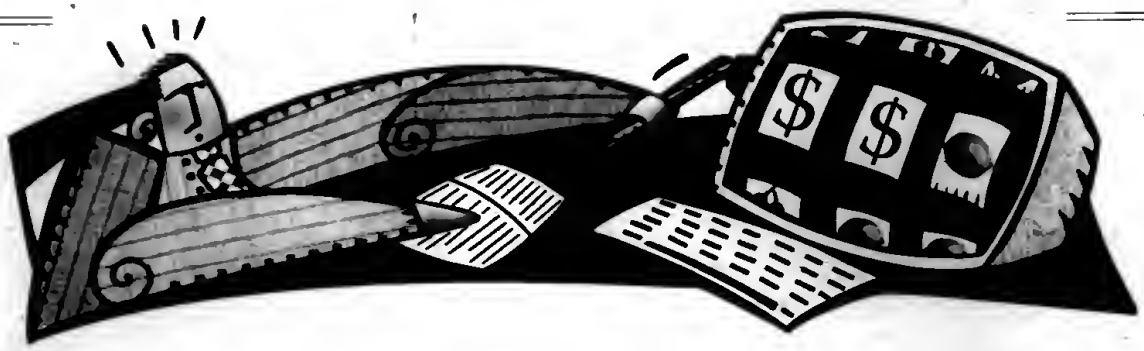
GET FREE INSTALLATION ON ALL GENICOM 4800 MODELS NOW THROUGH SEPTEMBER 29, 1995!

The GENICOM Advantage

GSA Schedule approved

© 1995 GENICOM Corporation. All company and/or product names are trademarks and/or registered trademarks of their respective owners. The ENERGY STAR™ emblem does not represent EPA endorsement of any product or service.

The CW Guide to Office Suites



Sometimes suites go sour,

Memory and support costs drag down the value of office suites

~By Michael Erbschloe~

If your users are craving suites such as Novell, Inc.'s PerfectOffice, Lotus Development Corp.'s SmartSuite and Microsoft Corp.'s Microsoft Office. Well, you're going to have to swallow some sour truths about costs, support issues and whether it's really worth the effort.

"Software suites are ideally suited for individual productivity," says Bob Simco, president of International Technology Group in Mountain View, Calif. "Suites are not very sweet when brought into larger computing environments."

While users like the consistent look and feel of suites and the fact that they can easily merge word processing, spreadsheet, database and presentation functions, information systems staffs must contend with the increased costs that suites entail.

"The basic configuration required for desktop PCs running software suites differs from PCs running DOS applications and even most Windows applications," Simco says.

In fact, companies are spending $10,000 or more to deploy hardware and software to each desktop, and they can expect to pay an additional $10,000 per unit each year for the next four or five years to cover support and upgrade costs, according to industry analysts.

The following is a breakdown of the cost-guzzlers:

Memory. Requirements have leaped from 1M or 2M bytes just a couple years ago to 4M, 8M and sometimes 16M bytes. The next round of upgrades will require at least 8M bytes of memory and, from what we hear on the street, it will more likely be a minimum of 16M to 32M bytes.

Hard disk space. Software packages that used to fit in 1M or 2M bytes of space now require up to 10M to 20M bytes, or even more, for a full suite. Future versions are likely to consume two to three times the hard disk space required for a 1994 or 1995 vintage package.

Video and bus requirements. Higher resolution monitors are becoming a standard, driving up the costs of the individual desktop unit. The graphic intensity of Windows-based products has also resulted in the need for faster and, of course, more expensive video bus architectures. The unacceptable alternative is to point, click and wait, and wait.

Other problems to contend with when deploying software suites include the following:

- Short-term productivity loss due to learning curves
- Overstated functionality

Hidden costs

Office suites are consuming more and more memory, which requires more advanced PCs. They are also cramped by the 640K-byte barrier of Windows 3.1. Windows 95 breaks down that barrier, but it only adds to the RAM cram.

	Lotus SmartSuite 3.0	Novell PerfectOffice 3.0	Microsoft Office 4.2
MEMORY REQUIREMENT	6.5	6.2	5.3
SUPPORT COSTS	6.3	6.1	6.0

1-to-10 scale where 1 is least satisfied and 10 is most satisfied

SOURCE: BUYERS' SATISFACTION SCORECARD, 155 USERS

Best of breed

No single application suite is best at everything. PerfectOffice's word processor makes up for its weak spreadsheet. Office needs work on its graphics package, and SmartSuite appears to be well rounded.

COMPUTERWORLD BUYERS SATISFACTION SCORECARD

This survey was based on interviews with roughly 50 users of each product. Users were asked to rate their satisfaction with the suite's three major application areas. These numbers represent the average of those ratings.

	Lotus SmartSuite 3.0	Novell PerfectOffice 3.0	Microsoft Office 4.2
SPREADSHEET	7.8	6.7	7.7
WORD PROCESSOR	7.1	8.1	7.7
GRAPHICS	7.2	7.0	6.9

1-to-10 scale where 1 is least satisfied and 10 is most satisfied

but users like the ingredients

- Poor interoperability
- Inability to use legacy documents with new suites
- Complexity of suites creates need for more sophisticated support
- Frequent upgrades
- Time — Deployment of suites takes time, sometimes months

Against all these issues are the following benefits that may still carry more weight:

- You can buy four applications in one box for $450 to $700. This can be almost a 4-to-1 savings over single applications, which cost $300 to $400 each.
- Users can obtain the same or superior functionality in one-tenth the time and effort. They have to learn only one interface, and there are no additional macros or other programming/installation issues required to link applications.
- There's less time for the staff to learn the installation and support for the product. There is now only a single environment to support.
- The productivity gains users experience may impact the company's bottom line directly, and IS also gains productivity if the company standardizes on a single desktop suite environment.

Easy to use

IS may have concerns about supporting suites, but users generally find them easy to use even though they contain multiple applications, links and configuration issues

	Lotus SmartSuite 3.0	Novell PerfectOffice 3.0	Microsoft Office 4.2
EASE OF USE	7.6	7.4	7.3

1-to-10 scale where 1 is least satisfied and 10 is most satisfied

But this bittersweet equation — productivity gains equals support pains — is unlikely to change anytime soon. Vendors are aware of the issues, but they are all retooling their products in preparation for future PC platforms.

The driving force behind the next round of suite releases is the upcoming migration to Microsoft's Windows 95.

These releases will likely impact support needs, migration schedules and support costs. They may also leave many users toggling between the new versions of suites and their legacy systems until all of the application packages once again are in sync with the new Windows environment. ■

Erbschloe is a consultant and freelance writer based in San Diego. He can be reached by CompuServe at 74172,3626.

WHAT PEOPLE ARE SAYING

Microsoft's Office 4.2

"Office's components — Word, Excel and Powerpoint — share a consistent interface. In fact, their respective menu bars are virtually identical." (Information Access Co., February 1995)

"The only suite that runs on Windows and Macintosh systems is Microsoft Office 4.2, which, however, lacks a database and [personal information manager]." (*PC Week*, Jan. 16, 1995)

Novell's PerfectOffice Professional, Version 3.0

PerfectOffice, "Is not that easy to use with other software." (Chester Bishop, IS manager, Enterprise Title, Pembroke Pines, Fla.)

"PerfectOffice has leapfrogged Microsoft's Office and Lotus' SmartSuite to become the most tightly integrated office suite on the market. In the increasingly critical area of workgroup support, PerfectOffice's Object Exchange data sharing technology makes the suite an especially attractive choice." (*Infoworld*, April 24, 1995)

"Buyers should be aware that PerfectOffice is resource-intensive. A complete installation of PerfectOffice Standard takes up 98M bytes of hard drive space — about 20M bytes more than SmartSuite or Office." (*PC Week*, Jan. 16, 1995)

Lotus' SmartSuite 3.0

"The functionality of the suite is adequate most of the time." (Susan Chandler, MIS director, Insurance Benefits Consults Ltd., Skokie, Ill.)

"With SmartSuite, Lotus has done a terrific job in giving its applications a consistent look and feel. The use of SmartMasters enhances consistency. Lack of uniformity, however, in areas such as File Open dialog boxes and the use of the right mouse button lessens its appeal as a suite of products, as does its limited support for [Microsoft's] OLE 2.0." (*Home Office Computing*, March 1995)

"Despite a consistent look and feel . . . SmartSuite lacks the slick integration — the drag-and-drop data sharing and in-place editing — of the OLE 2.0-capable Microsoft Office and PerfectOffice, though it does have the ability to link and embed ELE objects." (*Computer Shopper*, February 1995)

Lotus' NotesSuite: Strong but isolated

The combination of SmartSuite with Notes allows for greater teamwork, but don't try to add outside data or applications

~By Kevin Burden~

If Lotus Development Corp.'s SmartSuite simplifies work on the desktop and Notes improves team productivity, can the integration of the two in Lotus' NotesSuite be the answer to productivity bog-down?

Potentially, yes, according to four users interviewed.

NotesSuite makes it easier to develop groupware applications by tying many core applications into an integrated package. Jumping between applications and sending files to colleagues is reportedly faster and easier, thanks to the sturdy union.

But be warned: Do not expect the same integration of NotesSuite applications with Microsoft Corp. applications. Even if they have Notes/FX integration capabilities, applications from the competition still do not play well together.

Installation

Installing NotesSuite is no different than installing any other Windows application — it just takes up more space.

"Even our laptops are set up with large hard drives. Disk space is just not as big of an issue as it used to be," says a user at an oil and gas company.

The real issue is memory. NotesSuite stretches the 640K-byte memory barrier of Windows 3.1 to its limits, especially its Freelance Graphics 2.1 portion.

"When Freelance got bigger, we started having problems sending [Freelance] files with attached memos or documents. It's been a real killer for our mobile users after they load all their drivers," says the oil company user.

Upgrading any of the suite's applications over a network was fairly simple. "We create an E-mail message with a button on it that users click to start the install process," one user says. But upgrading the Notes portion caused problems in the past for two evaluators, and that has them dreading the release of Notes 4.0.

"We were jumping through hoops to get the [Notes] 2.x to 3.x upgrade to work," says a user at an insurance company.

Notes integration

Considering that several of the applications that make up NotesSuite are not Lotus originals, Lotus has done a masterful job of giving each a similar look and feel, users explain.

Notes/FX 1.1, Lotus' integration technology based on Microsoft's OLE, enables bidirectional sharing of data and tools among applications. Evaluators said they could flawlessly step in and out of suite applications while in Notes.

Integration with other apps

Notes/FX also provides the hooks to other desktop applications such as Microsoft's Office. Unfortunately, the integration was not as clean.

"We have been trying to use the FX capability in Microsoft Office — we have had nothing but problems. In those instances where we have been able to transfer a Microsoft file, the conversion is often a long process, and the file needs to be cleaned up. Other times, it just fails to make the link," says a user at an electric company.

The only solution was to keep conversions as simple as possible.

Application development

Stay within the document management development paradigm, and "it does a fine job," users say. But try to develop relational programs, and the problems begin.

To assist novice developers, NotesSuite delivers a variety of task-specific templates developers can build on.

"If we were not so concerned with our visual standards, we would have left the templates as they were. Lotus really put a lot of thought into them," the user at the insurance company says.

To fill some of the language's gaps, two of the users turned to Lotus' VIP.

Scalability

The server operating system dictates the scalability of NotesSuite more than any other factor. The evaluators used OS/2 on their servers and expressed similar convictions — "scalability per server is poor." ■

Burden is *Computerworld*'s senior researcher. Scorecard/Firing Line.

NotesSuite

Lotus Development Corp.
Cambridge, Mass.
(800) 343-5414

FIRING LINE

Computerworld interviewed four NotesSuite users from different industries for this evaluation. The verdict? Its applications are securely integrated, but problems abound when hooking NotesSuite up to outside applications.

	Oil and gas company	Insurance company	Construction company	Electric company
EASE OF INSTALLATION	7	7	7	8
	Installation was straightforward, but users anticipate a lot of manual work when upgrading to Notes 4.0.			
NOTES INTEGRATION WITH SUITE APPLICATIONS	7	8	7	9
	Notes/FX 1.1 technology worked flawlessly. Only the high memory demands of Freelance Graphics caused problems when used with Notes.			
NOTES INTEGRATION WITH NON-LOTUS APPLICATIONS	3	5	5	4
	Simple files converted successfully; complex files caused only headaches; Microsoft Office triggered reported migraines.			
APPLICATION DEVELOPMENT	7	9	7	7
	Users said development was masterful within its workflow/document management paradigm, especially with its numerous templates.			
SCALABILITY	8	4	4	6
	Per server scalability was trounced. Two evaluators said several OS/2 servers were needed for less than 1,000 clients.			

1-to-10 scale where 1 is least satisfied and 10 is most satisfied

Vendor response

Freelance memory

Slipstream files eliminate the memory management problems Freelance Graphics 2.1 causes when running with other memory-hungry applications. It will also benefit users with small amounts of conventional memory. Slipstream files are in NotesSuite and are available on CompuServe.
— Peter Van de Graaf, Freelance Graphics senior product manager

Notes/FX

Microsoft has been made aware of the Notes/FX technology problems in Office. The problem is not the FX protocol but the way Microsoft implemented it. Notes/FX and Notes are open technologies, and the integration any vendors provides is dictated by that vendor.
— Tom Kane, NotesSuite product manager

BEFORE YOU LET ANYONE INTO YOUR BACKOFFICE,

You've chosen Microsoft® BackOffice technology. Now, how can you be certain the people running it are up to speed? Simple. Make sure they're Microsoft Certified Systems Engineers. This certification ensures that your IT professionals are able to plan, implement, and support solutions with Microsoft BackOffice technology, as well as get the utmost performance from it.

In order to become a Microsoft Certified Systems Engineer, candidates must pass a series of rigorous exams that test their proficiency with the latest Microsoft BackOffice products, including the Windows NT™ Server operating system. Exams are performance-based, requiring a true understanding of the technology and an ability to apply these skills to real-world situations.

Microsoft certification makes your IT professionals more valuable to you and your company. They'll provide improved service and superior productivity. Which means that by investing in Microsoft certification, you're not only making the most of your technology, you're getting the most out of the people running it.

For information on the Microsoft Certified Systems Engineer credential and certification training available at Microsoft Authorized Technical Education Centers, call (800) 636-7544, Dept. UGQ.

Microsoft®
CERTIFIED PROFESSIONAL
Systems Engineer

© 1995 Microsoft Corporation. All rights reserved. Microsoft and Windows NT are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

The Search for

Computerworld and the Smit
1995 Chairmen's Committee for th
extend best wish

Launched in 1989, the Computerworld Smithsonian Awards Program salutes those who find answers with information technology. This annual awards program, representing a spirited partnership between Computerworld and the Smithsonian Institution's National Museum of American History, brings together the user and vendor communities in public recognition of innovation and hard work.

1995 Finalists nominated by the Computerworld Smithsonian Awards Chairmen's Committee:

BUSINESS & RELATED SERVICES

Bell Atlantic Information Systems
LiveWire
Nominated by Andersen Consulting

Federal Express
Powership II
Nominated by U.S. Robotics, Inc.

MCI Telecommunications, Inc.
networkMCI SmartPop
Nominated by Digital Equipment Corp.

SpeakEZ
Speaker Identification and Voice Recognition Software
Nominated by Price Waterhouse

Wal-Mart Stores, Inc.
Retail Link™ & Electronic Data Interchange
Nominated by Sterling Software

EDUCATION & ACADEMIA

Saginaw Valley State University
EarthVision: EPA's Grand Challenge for High Schools
Nominated by Cray Research, Inc.

Stevens Institute of Technology
The CREATE Project: Computing in Research and Education for Advanced Technology
Nominated by Zenith Data Systems

The Computer Museum
The Networked Planet Exhibit: Gateway Server to the Internet
Nominated by Stratus Computer, Inc.

University of California, Los Angeles
The UCLA Science Challenge
Nominated by Hewlett-Packard Company

Warren Consolidated Schools and Ameritech
ThinkLink
Nominated by Zenith Data Systems

ENVIRONMENT, ENERGY & AGRICULTURE

Adam Opel AG
Hazardous Material Control System (HMCS)
Nominated by EDS

Consortium for International Earth Science Information Network (CIESIN)
CIESIN's Gateway
Nominated by Hewlett-Packard Company

Marine Environmental Technology Operation (METO) of SAIC
Remote Ecological Monitoring of the Seafloor Technology (REMOTS®)
Nominated by Price Waterhouse

U.S. Environmental Protection Agency, Chesapeake Bay Program Office
Integrated Models of the Chesapeake Bay Watershed, Airshed and Estuary
Nominated by Cray Research, Inc.

Weyerhaeuser Company
Habitat Conservation Plan (HCP) for the Northern Spotted Owl
Nominated by Intel Corporation & Hewlett-Packard Company

FINANCE, INSURANCE & REAL ESTATE

Bank of America
COIN - Customer On-line Information Network
Nominated by MCI Telecommunications Corporation

Chicago Board of Trade (CBOT)
Securities Trading System
Nominated by Sybase, Inc.

FannieMae
Desktop Home Counselor
Nominated by Microsoft Corporation

New York Stock Exchange, Inc. (NYSE)
Integrated Technology Plan
Nominated by Arthur D. Little, Inc. & Hewlett-Packard Company

The First National Bank of Chicago
The Customer Workstation
Nominated by Oracle Corporation

Hosted by:

Patrick J. McGovern, Chairman of International Data Group
Gary J. Beach, President & CEO of Computerworld
Spencer Crew, Director of the Smithsonian Institution's National Museum of American History

Master of Ceremonies:

Susan Stanberg, National Public Radio

COMPUTERWORLD
The Newspaper of IS

New

hsonian Institution thank the eir work in nominating entries and es to the finalists.

GOVERNMENT & NON-PROFIT ORGANIZATIONS

Indian and Northern Affairs Canada(DIAND)
Dossier Executive Information System
Nominated by Hewlett-Packard Company

National Adoption Center
National Adoption Exchange
Nominated by KPMG Peat Marwick

Norwegian Police Data Processing Services
POS - Police Operations Support System
Nominated by Andersen Consulting

United Nations High Commissioner for Refugees
Operation reUNite
Nominated by EDS

United States Social Security Administration
Assistive Computing Devices for the Disabled Workforce
Nominated by Madge Network Systems

MANUFACTURING

Alcan International Ltd.
Computer Simulated Sheet Metal Stamping
Nominated by Cray Research, Inc.

Bayer AG
Chemical Process Simulation of Integrated Plants
Nominated by Cray Research, Inc.

Boeing Commerical Airplane Group, 777 Division
Computing and the Boeing Design
Nominated by Intel Corp. & Ernst & Young

Cox Communications, Inc.
Electric Commerce Network (ECNet)
Nominated by Digital Equipment Corporation

International Rectifier
VISION System
Nominated by Andersen Consulting

MEDIA, ARTS & ENTERTAINMENT

America OnLine Technology
Network Communications and Systems Programming
Nominated by Hewlett-Packard Company

Carnegie Mellon University
The Networked Virtual Art Museum: The Temple of Horus
Nominated by Intel Corporation

Maxis
SIM Product Line
Nominated by Intel Corporation

National Center for Supercomputing Applications
NCSA Mosaic
Nominated by IBM Corporation

U.S. News & World Report
U.S. News Online
Nominated by CompuServe

MEDICINE

National Marrow Donor Program
STAR Bone Marrow Registry
Nominated by Andersen Consulting

PharMark Corporation
RationalMed®
Nominated by Digital Equipment Corporation

Rose Health Care System/Lockheed Martin
Automated Mammogram Analysis Project
Nominated by Shared Medical Systems Corporation

Stanford Health Services Home Health Care Department
Home Health Care Information System
Nominated by Zenith Data Systems

United Network for Organ Sharing (UNOS)
Organ Information System
Nominated by Lotus Development Corporation

SCIENCE

DuPont
Alternatives to Chloroflourocarbons
Nominated by Cray Research, Inc.

European Centre for Medium-Range Weather Forecasts (ECMWF)
Spectral Weather Forecasting Model Using Massively Parallel Processing (MPP)
Nominated by Cray Research, Inc.

Fox Chase Cancer Center
Cooperative Human Linkage Center
Nominated by Digital Equipment Corporation

Interdisciplinary Centre for Mathematical and Computational Modeling (ICM), Warsaw University
Visualization Techniques and Quantum-Classical Dynamics Software Tools for Simulations of Enzymatic Reactions
Nominated by Cray Research, Inc.

Pittsburg Supercomputing Center and the Universtiy of Chicago
Simulation to Predict Comet-Planet Collision
Nominated by Cray Research, Inc.

TRANSPORTATION

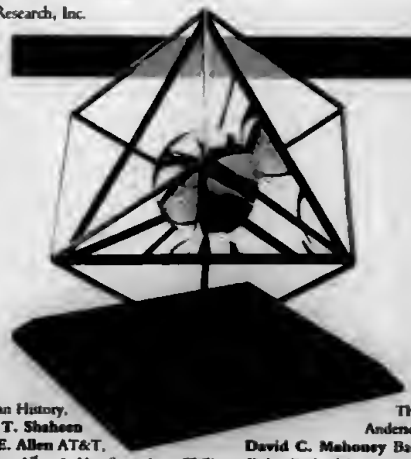
AlliedSignal, Inc.
Forward-Looking Windshear Weather Radar System
Nominated by Price Waterhouse

Hongkong International Terminals Limited
Ship Planning System
Nominated by Sun Microsystems, Inc.

Scandinavian Airlines System (SAS)
Origin and Destination Revenue Management System
Nominated by Unisys Corporation

Toronto Transit Commission
Wheel Trans Information System (WTIS)
Nominated by Computer Associates International, Inc.

U.S. Military Traffic Managment Command (MTMC)
Worldwide Port System (WPS)
Nominated by Oracle Corporation



The Computerworld Smithsonian Chairmen's Committee

Patrick J. McGovern International Data Group, **Gary J. Beach** Computerworld, **Spencer Crew** National Museum of American History, The Smithsonian Institution, **Eric A. Benhamou** 3Com Corp., **John E. Warnock** Adobe Systems, Inc., **John C. Lewis** Amdahl Corp., **George T. Shaheen** Andersen Consulting, **Michael Spindler** Apple Computer, Inc., **Tamara J. Erickson** Arthur D. Little, Inc., **Randy Phillips** Ascom Timeplex, **Robert E. Allen** AT&T, **David C. Mahoney** Banyan Systems, Inc., **Paul J. Severino** Bay Networks, **George H. Heilmeier** Bellcore, **Max Watson** BMC Software, Inc., **Robert Franz** Booz•Allen & Hamilton, Inc., **Philippe Kahn** Borland International, Inc., **Axel Leblois** Bull HN Information Systems, Inc., **Aubrey G. Chernick** Candle Corp., **John West** CIMLINC, Inc., **Thomas M. Nies** Cincom Systems, Inc., **John Slevin** Comdisco, Inc., **Benjamin M. Rosen** Compaq Computer Corp., **Robert P. Mainor** CompuServe, **Charles B. Wang** Computer Associates International, Inc., **John A. Sisto** Computer Horizons Corp., **Peter Karamanos** Compuware Corp., **John Jacobs** Coopers & Lybrand Consulting, **J. Phillip Samper** Cray Research, Inc., **Douglas Macintyre** D&B Software, **Ronald Skates** Data General Corp., **Michael Dell** Dell Computer Corp., **Steven Sprinkle** Deloitte & Touche, **Robert W. Mahoney** Diebold, Inc., **Robert B. Palmer** Digital Equipment Corp., **John McDonough** Easel Corp., **George M. Fisher** Eastman Kodak Co., **Les Alberthal** EDS, **Richard J. Egan** EMC Corp., **Norio Niwa** Epson America, **David Shpilberg Colcher** Ernst & Young, **Michael Kennedy** Excalibur Technologies Corp., **Ted Smith** FileNet Corp., **Frank Jerd** Gandalf Systems Corp., **Dennis Hayes** Hayes Microcomputer Products, Inc., **Lewis E. Platt** Hewlett-Packard Co., **John Staedke** Hitachi Data Systems, **Jack A. Shaw** Hughes Network Systems, **Louis Gerstner** IBM Corp., **Gerald D. Cohen** Information Builders, Inc., **Phil White** Informix Software, **Craig R. Barrett** Intel Corp., **Allan Frank** KPMG Peat Marwick, **Raymond C. Kurzweil** Kurzweil Applied Intelligence, Inc., **Jerry Stead** LEGENT Corp., **Marvin L. Mann** Lexmark International, Inc., **John Brophy** Lockheed IMS, **Jim Manzi** Lotus Development Corp., **Robert Madge** Madge Networks, Inc., **Jack McDonnell** McDATA Corp., **Bert C. Roberts, Jr.** MCI Telecommunications Corp., **Roland Pampel** Microcom, **Phil Cunningham** Microdyne, **William H. Gates** Microsoft Corp., **Merritt Lutz** Morgan Stanley Client Technology, **Gary Tooker** Motorola, Inc., **Kenjiro Nitta** NEC Technologies, Inc., **Robert L. Puette** NetFRAME Systems, Inc., **Steven P. Jobs** NeXT Computer, Inc., **Robert J. Frankenberg** Novell, Inc., **Ivan Seidenberg** NYNEX Corp., **Lawrence J. Ellison** Oracle Corp., **Timothy J. Curran** Panasonic Communications & Systems Co., **Norman E. Gaut** PictureTel Corp., **Andrew Filipowski** Platinum Technology, **Scott W. Kaufman** Price Waterhouse, **Lars Turndal** S C O, **J.R. Beyster** SAIC, **Klaus Besier** SAP America, Inc., **James H. Goodnight** SAS Institute, Inc., **Casey Powell** Sequent Computer Systems, Inc., **R. James Macaleer** Shared Medical Systems Corp., **Edward McCracken** Silicon Graphics, Inc., **Michael J. King** Software AG of North America, Inc., **Salvatore Simeone** Software Engineering of America, Inc., **William T. Esrey** Sprint, **Sterling Williams** Sterling Software, Inc., **Ryal R. Poppa** Storage Technology Corp., **William E. Foster** Stratus Computer, Inc., **Scott G. McNealy** Sun Microsystems, Inc., **Mark B. Hoffman** Sybase, Inc., **Gordon Eubanks** Symantec Corp., **Vincent Tirendi** Syntrex Technologies, Inc., **James G. Treybig** Tandem Computers, Inc., **William Waltrip** Technology Solutions Co., **Ron Brittian** Texas Instruments, Inc., **Frank Moss** Tivoli Systems, Inc., **Atsutoshi Nishida** Toshiba America Information Systems, Inc., **Casey Cowell** U.S. Robotics, Inc., **Roel Pieper** UB Networks, Inc., **James A. Unruh** Unisys Corp., **Joseph M. Tucci** Wang Laboratories, Inc., **Morris Chang** Wyse Technology, Inc., **Paul Allaire** Xerox Corp., **Jacques Noels** Zenith Data Systems

IT'S THE SAME WITH TCP/IP FOR WINDOWS... WITHOUT GREAT SUPPORT, YOU'RE NOWHERE.

PC/TCP
OnNet
for DOS/Windows

NOBODY STANDS BEHIND THEIR TCP/IP APPLICATIONS BETTER THAN FTP SOFTWARE.

Face it. Having the latest whiz-bang TCP/IP applications for Windows doesn't mean a thing if you can't keep them up and running. That's why more and more companies are installing FTP Software's OnNet™, the world's most advanced suite of TCP/IP applications for Windows/DOS. Primarily, they're choosing OnNet because it *works*. It installs quickly and easily, and it's built like a tank to keep on working even in the most hostile environments. But when our customers do need help, anywhere in the world, we're right there with one of the largest, most experienced TCP/IP development and support organizations in the business. We also offer introductory and advanced training programs, and consulting engineering. If you're heading into the exciting world of global internetworking, make sure you've got the TCP/IP company with a decade of experience behind you.

COMPARE	FTP Software PC/TCP OnNet™ 1.2	Novell® LAN Workplace™ DOS 4.2	NetManage™ Chameleon™ 4.5
Architecture (Windows/Dos)	VxD or TSR	TSR	DLL
NFS Client Included	YES (VxD or TSR)	Cost Option	Cost Option
Conventional Memory	3K	42K	6K
File Locking	YES	YES	NO

G - ANY WHERE NETWORKING SOLUTIONS

Call us for complete information about our growing OnNet product family.

1-800-282-4FTP, ext. 420
e-mail: info@ftp.com
WWW: http://www.ftp.com
SUPPORT: 1-800-382-4387
support@ftp.com

FREE! Evaluation Copy* PC/TCP Outlet CALL NOW!

*Qualified U.S. Customers Only

ftp Software®

Opening Windows To Productivity.

FTP Software, 100 Brickstone Square, Andover, MA 01810 (508) 685 3300

OnNet and the GO ANYWHERE logo are trademarks and PC/TCP is a registered trademark of FTP Software Inc. Other tradenames, trademarks, or registered trademarks are the property of their respective holders.

Making a difference

Every June we take a break from reporting on technology as a purely money-saving, productivity-enhancing, competitive advantage-creating hunch of bits that can rocket a company to fame and fortune.

On the next three pages, you'll meet six of the 50 finalists for the Seventh Annual *Computerworld* Smithsonian Awards, which honor applications that improve society and our lives. Information technology is helping the innovative heroes among us do the awe-inspiring. And when all is said and done, perhaps that is technology's greatest gift.

★ **7th Annual Computerworld Smithsonian Awards**

FINALISTS FOR THE 1995 COMPUTERWORLD SMITHSONIAN AWARDS

Business and related services

Bell Atlantic Information Systems
Diagnosing phone network problems before they happen

FedEx Corp.
Tying into the customer fulfillment process

MCI Communications Corp.
Round-the-clock telecom network capability that borrows public voice network capacity as needed

SpeechEZ
Using voice patterns to identify individuals for credit cards, security systems and automated teller machines

Wal-Mart Stores, Inc.
Sharing detailed sales data with 10,000 venders

Education and academia

Saginaw Valley State University
High school students access supercomputers to carry out environmental research

Stevens Institute of Technology
Making computing pervasive throughout its college curriculum

The Computer Museum
Exhibits that provide perspective on the impact of computers on our planet

University of California, Los Angeles
Computer simulation of apparatus such as telescopes and spectrometers

Warren Consolidated Schools/Ameritech, Inc.
See story, page 102

Environment, energy and agriculture

Adam Opel AG
Reducing use of hazardous waste-causing materials

Consortium for International Earth Science Information Network
Providing a gateway to databases to help with public policy decision-making

Marine Environmental Technology Operation
Monitoring to protect the aquatic ecosystem

Chesapeake Bay Program
See story, page 102

Weyerhaeuser Co.
Modeling 80-year tree-harvesting scenarios to protect owls and keep jobs

Finance, insurance and real estate

Bank of America
Automating the handling of 5 million transactions a day

Chicago Board of Trade
Handheld units let traders write in trade data, reducing paper

Fannie Mae
On-line financial analysis for low-income clients who want to buy homes

Continued on page 102

GOVERNMENT AND NONPROFITS

Database pairs kids and adoptive families

Patty, a 4-year-old African-American girl, was prenatally exposed to cocaine and other drugs. Her birth mother was HIV-positive, though Patty is not. Like other children locked in the foster care system, Patty was labeled "difficult" to adopt.

Patty was in foster care for two years before she was matched with a family via the computerized database system of the National Adoption Exchange (NAE), a program of the National Adoption Center. Typically, a child/family placement takes from several months to a few years, but the NAE was able to place Patty with her permanent family in only three months. No longer the withdrawn, timid child she was two years ago, Patty today participates in choir, jazz, ballet and tap dancing.

The NAE's database enables social workers to bring up possible matches quickly. "In no more than 10 seconds, I was able to print out five prospective children for Patty's adoptive mother to review," says Karen Colalongo, regional child adoption coordinator at the NAE and Patty's social worker.

★ **FINALIST**
National Adoption Center

"When we first started out, we actually had a recipe file box where we kept color-coded index cards on families, children and matches," says MariAnne Clarke, deputy executive director of the NAE. Now, the Unix system has expanded to bulletin board services and electronic mail for social workers nationwide to access.

Via E-mail, social workers can easily find information about interstate adoption, nontraditional adoption (such as single parents and transracial parents), disabilities and child welfare. They can also look beyond their local jurisdiction and place children in other states.

The NAE is working on an on-line program called "Faces of Adoption," which will be available on the Internet this summer at http://www.adopt.org/adopt.

— By Joyce Chutchian-Ferranti, managing editor, special projects

Making a difference, *page 102*

Split-second database searching enabled social workers to match Linda Bates Jones' profile (see screen above) with that of Patty (see screen at right). In just three months, Patty (above, center) joined her new adoptive family (from left to right), Jones, Sherita and Raquel.

GOVERNMENT AND NONPROFITS

Reuniting war-torn families

Ismeta had not seen or heard from three of her children in 2½ years. Victims of war in the former Yugoslavia, the children were evacuated from their Mostar school during shelling, split up and sent to refugee centers in Croatia and Macedonia.

Then last December, after hearing of Operation reUNite — a new service by the United Nations' High Commissioner for Refugees (UNHCR) that helps relatives locate missing children — Ismeta found herself at a computer, searching for her children. Quickly, she found her two boys, Azem, now 16, and Mujcina, 18, by their last name. But she could not find her daughter Zlata, now 20.

★ FINALIST

UN High Commissioner for Refugees

Operation reUNite is working to reunite 5,500 children, including 2½-year-old Benjamin Smailbegovic (center) and his sister, Marina, age 4 (right), with their parents. For now, the children are living with Mina Becar (left), a neighbor from their hometown of Teslanj, Bosnia-Herzegovina.

She searched on Zlata's birthplace. Then by age and gender. At last, Zlata's picture appeared on the screen — the problem was a misspelled last name. "Thank God they are all alive," Ismeta says.

Operation reUNite was the brainchild of Ken Dodd, director for international sales at Electronic Data Systems Corp.'s Business Process Systems and Services in Troy, Mich. Together with a handful of EDS volunteers, Dodd prototyped a system in early 1993.

Shortly after, Dodd met with Alexander Casella, coordinator for mass information at the UNHCR in Geneva, and the force behind Operation reUNite. They agreed to set up the system at the EDS office in Paris, where staff would enter children's biographical data and photos and produce CD-ROMs. The project became operational last August.

The latest CD-ROM, distributed in May, has data on nearly 5,500 children. The UNHCR maintains 11 centers in the former Yugoslavia where families can search for children. Laptops are also in use.

Ismeta is among the lucky few. Since Operation reUNite began late last year, only 1 t positive identifications have been made. There are anywhere from 10,000 to 40,000 children separated from their families, sources say. Many have no idea where their parents are.

But Casella is optimistic. "The numbers will increase in time," he says.

— By Bruce Rayner, special projects editor

Continued from page 101

New York Stock Exchange, Inc.
Flat-panel displays that present more complete trading information

The First National Bank of Chicago
Enabling bank staff to know exact status of customer accounts

Government and nonprofits

Indian and Northern Affairs Canada
Expanding government officials' knowledge of aboriginal populations

National Adoption Center
See story, page 101

Norwegian Police Data Processing Services
Global IS and electronic maps helped police with Lillehammer Olympics security

United Nations High Commissioner for Refugees
See story at left

U.S. Social Security Administration
Systems that enable the agency to hire more disabled workers

Manufacturing

Alcan International Ltd.
Computer simulation and animation help staff form aluminum car panels

Bayer AG
Integration of all departments' operations in a chemical plant onto a single supercomputer

Boeing Commercial Airplane Group, 777 Division
Digital specification of every part in the 777 aircraft so fuselage was accurate within one-thousandth of an inch

Cox Communications, Inc.
Speedy communications among 10 Phoenix firms

International Rectifier
Worldwide management of chip inventory and orders

Continued on page 105

EDUCATION AND ACADEMIA

Multimedia extends school day — and kids don't mind

Twelve-year-old Amanda Hayden says she used to be bored with science. Not anymore. Amanda took part in a program that made learning fun. Using interactive television at home to do schoolwork, Amanda says, "you didn't think of it as learning, you thought of it as entertainment."

Like most school systems today, Amanda's in Warren, Mich., has been under pressure to keep testing scores high and technology current in the face of public dissatisfaction with government-funded education. Enter ThinkLink, a school-business partnership program that ran during the 1993-1994 school year in the Warren Consolidated Schools system.

★ FINALIST

Warren Consolidated Schools/ Ameritech

The project was largely funded by a $5 million grant from Ameritech, Inc., a Chicago-based cable TV operator trying to gain a foothold in the Michigan market. One hundred and fifty students at two of the 14 schools in the Warren area had the chance to tap into ThinkLink. The students started the program in the fourth grade and finished in the fifth.

ThinkLink enables students to access interactive TV programs at home by connecting to VCRs, laser discs and CD-ROMs via fiber-optic cable lines that connect to Ameritech's switching center. The multimedia learning programs were mapped to the students' math, language arts, science and social studies curriculum.

The program was a boon. Scores on the Michigan Education Assessment Program science test, which is given to fifth-graders across the state, showed that the students who participated in ThinkLink received 15% higher scores than those who did not.

Amanda Hayden (front) was one of 150 fifth-grade students in Warren, Mich., who participated in a yearlong multimedia program that lets kids work on school curriculum at home. Mother, Jeanette, and brother, Bryan, work on their computer in the background.

But perhaps the best measure of the program's success was the students' response. "It made me understand more, and it made learning fun," Amanda says.

— By William Brandel, senior editor

One of the major components of the Chesapeake Bay Program's 3-D integrated modeling system is current land use, on which researchers base what-if scenarios to predict the success of environmental cleanup actions

ENVIRONMENT, ENERGY AND AGRICULTURE

Modeling joins fight to clean up Chesapeake Bay

The Chesapeake Bay has been an environmental nightmare. Years of runoff from surrounding agricultural and urban lands, sewage treatment plants and industrial sources so depleted the oxygen levels in the water that fish and vegetation have disappeared in great numbers.

The impact on the fishing industry has been great, closing a striped bass fishery, a shad fishery and decimating the oyster industry, says Fran Flanigan, executive director of the Alliance for the Chesapeake Bay.

★ FINALIST

EPA Chesapeake Bay Program Office

The Chesapeake Bay Program — an effort of the Environmental Protection Agency (EPA) and the bay-area states of Maryland, Pennsylvania and Virginia — was created in 1983 to stem the bay's slide into biological wasteland. The program's goal is to reduce polluting nutrients in the 64,000-sq.-mile watershed area by 40% in five years.

Its main weapon? A sophisticated three-dimensional modeling system that helps researchers look at the effects of excess nutrients on the water, estuary and air. The modeling system runs on Cray YMP and C-90 supercomputers from Cray Research, Inc.

These models let researchers look at the bay's past, present and future and construct what-if scenarios. For instance, researchers estimate that a 40% reduction of nutrients in the water will reduce the dead (or oxygenless) waters of the bay by 20%. If no action is taken, the dead waters will increase by 14%, says Lewis Linker, project coordinator at the U.S. EPA Chesapeake Bay Program. "The model has been helpful in teaching us how to pinpoint remedial actions," Flanigan says.

Those "remedial actions" include farm controls and sewage treatment plant upgrades, said Robert Perciasepe, assistant administrator for water at the EPA.

Apparently the cleanup efforts are paying off. Rock fish, striped bass and some vegetation are returning to the bay, and authorities have eased restrictions on swimming and fishing.

— By Amy Malloy, intern

Making a difference, page 105

EACH BLINK OF AN EYE IS BARRAGED WITH CHOICE.

FORTUNATELY, WITH MICROSOFT BACKOFFICE TRAINING, THERE'S ONLY ONE WAY TO GO.

☛ You make decisions every second of every day. From breakfast cereal to staffing needs. And now that you've made a smart one selecting Microsoft technology, why not follow it with the only logical place for training, Microsoft® Authorized Technical Education Centers (ATEC)? ☛ ATECs are the exclusive providers of Microsoft Official Curriculum, developed by Microsoft developers and support engineers. They've researched what people need to develop, install and support solutions using Microsoft technologies. And with more than 80 courses in 8 languages, all your Microsoft training needs can be met. From development tools to operating systems. ☛ When you need training, the quality of instructors is critical, so ATECs use only Microsoft Certified Trainers. Frequent testing ensures they're knowledgeable, credible and current. And since they use real-world skills-based training, your employees actually come back to work, ready to work. ☛ In addition, ATECs offer the best way to prepare for MS Certified Professional exams. Employees directly responsible for implementation and support can attain the Microsoft Certified Systems Engineer credential. And software developers building custom applications using Microsoft development tools can pursue the Microsoft Certified Solution Developer certification. ☛ To find your nearest ATEC or to get a copy of the Microsoft Education and Certification Roadmap, call (800) SOL-PROV, Dept. UVX. Now that we've helped make this decision an easy one, get on with those more difficult ones.

Microsoft®
SOLUTION PROVIDER
Authorized Technical Education Center

© 1995 Microsoft Corporation. All rights reserved. Microsoft is a registered trademark of Microsoft Corporation.

COMPUTERWORLD
CLIENT/SERVER
JOURNAL

On June 15,

in a special edition of Computerworld Client/Server Journal

CLIENT/SERVER EXCELLENCE

The Magazine

Client/server. Where's it at in the real world? You'll find out in a special June 15 edition of Computerworld Client/Server Journal. With the expertise of Cambridge Technology Partners, a world renowned client/server consultancy, we surveyed more than 250 North American organizations to gauge their client/server prowess. Our special issue will list the 20 most effective users of client/server technology by measuring their:

- *Investment in infrastructure.*
- *Application architecture and deployment.*
- *Applications' hard and soft benefits.*
- *Technology/business strategy alignment.*
- *IT management philosophy and culture.*

The Event

On June 15, at DCI's **Database & Client/Server World** in Boston, you're invited to a panel discussion at 9:30 that includes representatives from several of the Top 20 companies, the survey judges and moderator Alan Alper, editor of Computerworld Client/Server Journal. Hear firsthand what went into selecting the Top 20 and how these organizations made client/server work for them.

For more information on this panel, call (508) 470-3880.

Magazine Sponsor

POWERSOFT CODE

Research Partners

Cambridge Technology Partners

Event Sponsor

DCI
Digital Consulting Inc.

COMPUTERWORLD
CLIENT/SERVER
JOURNAL

Where distributed computing meets business objectives

MEDICINE

System speeds matching of donor organs with patients

Every day in the U.S., eight people die waiting for an organ transplant. Every day, they die waiting for a surgeon to announce that a matching kidney or liver or heart has been located. Every day, the United Network for Organ Sharing (UNOS) tries to reduce this statistic.

All U.S. transplant centers belong to UNOS, a private, nonprofit corporation based in Richmond, Va. UNOS coordinates the placement of organs from cadaveric donors throughout the U.S., achieving this monumental mission by matching donor organs with patients (more than 38,000 to date) on waiting lists through an on-line system called Xpedite. They also provide the vital medical information about donor organs to all transplant centers nationwide.

★ FINALIST

United Network for Organ Sharing

"Historically, an organ procurement coordinator at the donor hospital made a series of individual phone calls to several transplant centers, according to a priority ranking of potential recipients," says David Klein,

South Eastern Organ Procurement Foundation

Donated organs must be carefully preserved and must be transported within a matter of hours. "Organs can't live a long time on life support," says David Klein, director of computer services at the United Network for Organ Sharing. "The faster they get placed, the healthier they are."

director of computer services at UNOS. The coordinator would "repeat the process several times for each organ." These coordinators then had to wait, like the patients, to hear back from the transplant centers.

Klein says several hours could pass before hospitals could place an organ. "We needed a way to get donor information distributed to transplant centers quickly," he notes. UNOS turned to American Management Systems (AMS) in Fairfax, Va., for assistance. AMS' goal was to get information about matches to surgeons quickly and tie the information into legacy applications in hospitals across the country. "We needed to turn the sequential process of calling and recalling for each organ into a parallel process," says Mike Titmus, vice president of AMS.

Using Xpedite, which became fully operational in January, UNOS receives donor information via Notes from the donor site. The computer-matching system generates a prioritized list of potential recipients. UNOS then pages the listed transplant centers with SkyTel, inc. pagers. Each transplant center accesses the central donor information database using Notes. The centers can also tap in by using the phone and Lotus Development Corp.'s PhoneNotes to get the information automatically faxed to them.

"Organs can't live a long time on life support," Klein says, "so the faster they get placed, the healthier they are."

Dr. Mark Aeder, director of transplantation at the Research Medical Center in Kansas City, Mo., says Xpedite greatly benefits the entire transplant community. "Xpedite will accelerate the timely placement of transplantable organs and, hopefully, optimize organ sharing."

— By Stewart Deck, new products writer

Continued from page 102

Media, arts and entertainment

America On-Line Technology
Multimedia network lets 2 million subscribers communicate, get news

Carnegie Mellon University
Users "walk" through an ancient temple using virtual reality

Mesa
The SIM product line offers simulations of cities, planets and farms so students can see complex systems in action

National Center for Supercomputing Applications
Mosaic allows users to browse the Internet

U.S. News & World Report
Providing world news electronically

Medicine

National Marrow Donor Program
Matching bone marrow donors and patients

PharMark Corp.
Identifying patients at high risk for drug-induced conditions

Ross Health Care System/Martin Marietta
System to scan mammograms and aid in interpretation

Stanford Health Services Home Health Care Department
Laptops let home caregivers keep track of schedules, patient records on-site

United Network for Organ Sharing
See story at left

Science

Du Pont Co.
See story at right

European Center for Medium-Range Weather Forecasts
Providing accurate weather forecasts a week in advance

Fox Chase Cancer Center
Research from four separate chromosome research centers consolidated into a single human genetic map

Warsaw University
Full-motion video of chemical interactions of molecules

Pittsburgh Supercomputing Center/University of Chicago
Advanced simulation of the impact of a comet on Jupiter

Transportation

AlliedSignal, Inc.
Warning of wind shear

Hong Kong International Terminals Ltd.
Twin displays of a ship's cargo hold and the dockyard guide port staff in loading, loading and unloading freight

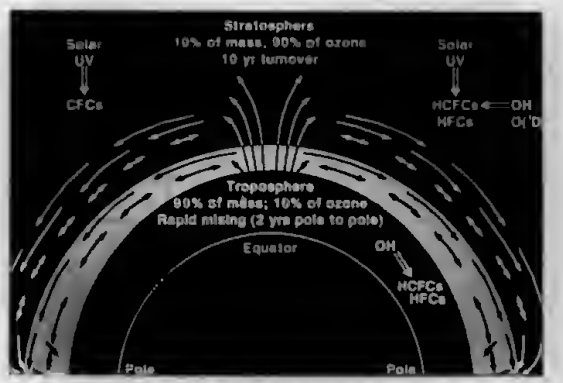
Scandinavian Airlines System
On-line updated data on airline seats at each fare level

Toronto Transit Commission
System that schedules 5,000 trips per day for disabled citizens

U.S. Military Traffic Management Command
Worldwide cargo management systems to plan better distribution

SCIENCE

Say good-bye to ozone-wrecking chemicals



Du Pont's atmospheric model is being used to help design CFC alternatives that do not destroy ozone layers and minimize global warming conditions

When the world's top industrial nations signed the Montreal Protocol in 1987 — a treaty that called for a 50% reduction in the use of ozone-depleting chlorofluorocarbons (CFC) in the next 10 years — Du Pont Co. might have been expected to drag its feet.

After all, with nearly $1 billion in annual sales from the manufacture of CFCs — which are used primarily as coolants in refrigerators and air conditioners — the Wilmington, Del.-based chemical giant had a lot at stake.

Instead, Du Pont has taken a proactive approach to the environmental problem and has led the charge to create CFC alternative compounds. For example, Du Pont volunteered to phase out its CFC production by the end of last year, but the Environmental Protection Agency later asked Du Pont to continue producing CFCs through the end of this year to fulfill national requirements.

★ FINALIST

Du Pont Co.

"There's no question that Du Pont has been the leader in spearheading CFC alternative developments," says Professor Donald J. Wuebbles, department head of atmospheric sciences at the University of Illinois at Urbana-Champaign.

Computational modeling pioneer

In an effort to uncover CFC alternatives that have minimal impact on the environment, Du Pont began using sophisticated computational modeling techniques as early as the late 1970s. That's when scientific research first began to link the compounds with the destruction of the earth's ozone layer, which shields plant and animal life from the harmful effects of ultraviolet radiation.

Du Pont has relied on four generations of Cray Research, Inc. supercomputers to do its computational modeling since 1986, according to Dr. David Dixon, a research leader in central research and development at Du Pont. Much of the computer modeling and simulation is done using Silicon Graphics, Inc. workstations over a Digital Equipment Corp. VAX-cluster network.

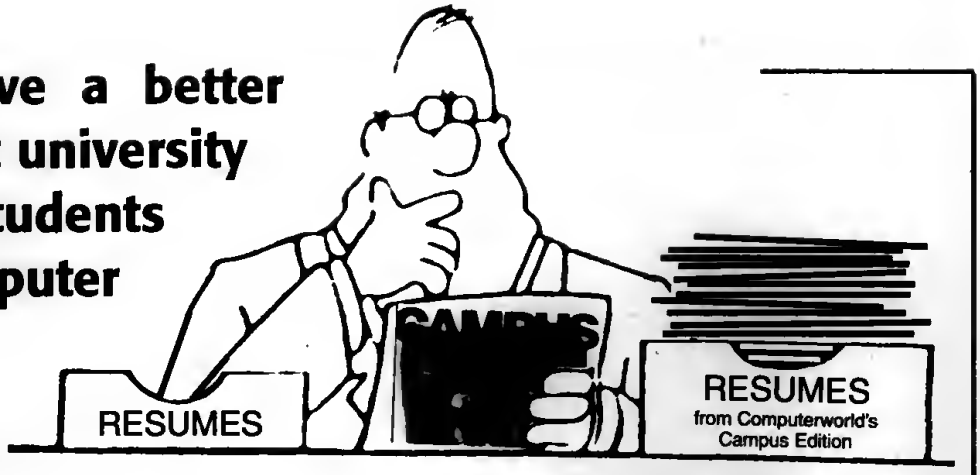
The high-performance systems have helped Du Pont estimate the impact that CFC replacements, such as hydrochlorofluorocarbons (HCFC), might have on the environment.

For example, Du Pont uses the computers to do atmospheric modeling to determine how HCFCs can be expected to react with solar energy in the stratosphere.

By using the computational modeling techniques to arrive at environmentally acceptable CFC alternatives, the chemical company has been able to put its HCFC plants on-line faster than it expected, according to Dixon.

— By Thomas Hoffman, senior editor

Now you have a better way to recruit university and college students planning computer careers:



Computerworld's eighth annual Campus Recruitment Edition

If you recruit top computer students on America's campuses, your message in this special issue will target more of them than any other newspaper or magazine!

Now you can recruit computer talent on campus without leaving your office!

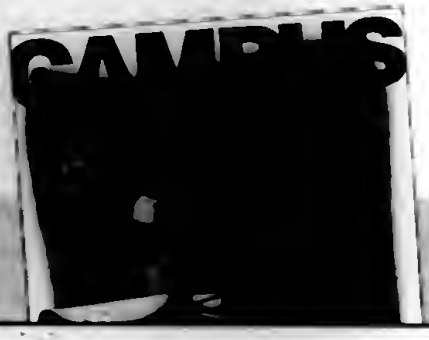
That's because 100,000 copies of this special issue will be distributed to America's best and brightest students enrolled in Information Systems, Computer Science, Computer Engineering, Electrical Engineering, and just about any other computer-related curricula.

Computerworld's Campus Edition works!

Just ask John Nyhan, Director of Recruiting at CSC Consulting who said: "I have found over the years that *Computerworld's* Campus Edition has been THE vehicle in getting our name and our company exposed to a substantial number of Information Systems students across the country. I feel it is a magazine that is widely read by the college student and our advertising in it has been successful in getting people to know who we are before we come on campus."

Finally you can cost-effectively reach the quality and quantity of students you need!

And you can do it with just one advertisement in *Computerworld's* Campus Recruitment Edition! For a rate card reflecting complete campus distribution, call John Corrigan at 800/343-6474 (in MA, 508/879-0700). But hurry... This issue closes September 15, 1995.



Advertise in *Computerworld's* Campus Edition today.

Issue Date: **October 31, 1995**
Close: **September 15, 1995**

CAMPUS RECRUITMENT EDITION EIGHTH ANNUAL
8th
ANNUAL

Computer Careers

Question of the month:
What's the worst job you've ever had? The best?
Send responses to: **jnaze@cw.com**
or fax to: **(508) 875-8931**

JOBS *in* SPACE

Aerospace companies and their outsourcing providers scramble for highly specialized talent to fill current contracts

By Bryan Scanlon
and Amy Bermar

McDonnell Douglas Aerospace won 46 of the 55 fixed-wing military aircraft awards in the Department of Defense's fiscal 1995 budget. So what?

So, the firm will be hiring 250 software engineers to meet demand on several projects, says James Diller, administrator of professional employment at the McDonnell Douglas Corp. division in St. Louis.

"Even though we've had some layoffs, we're always hiring for particular skills," Diller says. Specifically, programmers with Ada, C and C++ expertise are in highest demand for projects such as the F-15 Eagle, F/A-18 Hornet, the C-17 Transport and flight simulation programs.

In the intensely project-driven aerospace industry, new awards can spawn hundreds of job openings for information systems professionals. Once under way, many projects expand dramatically.

"There are always changes in the initial scope," says Jerome Haynesworth, director of human resources at Hughes Information Technology Corp. in Reston, Va., a $2 billion division of Hughes Aircraft Co. "You might need 200 people to get started and another 100 to help you hit another milestone."

The Hughes division is seeking software engineers with experience in Oracle, Unix, C++ and other object-oriented languages and will hire 300 IS people this year. Many will help design Unix front ends to Mosaic and other Internet browsers.

For aerospace companies, implementing an infrastructure that lets employees communicate more easily with customers and suppliers is a high priority. For Paul Hoedeman, chief information officer at Allied Signal Aerospace in Torrance, Calif., it is one of the primary business objectives. "Our job is to link the organization together and enable workflow within or even outside of the company," says Hoedeman, about the 750-person IS department.

The firm has been hiring people with computer science skills since mid-1993 and expects to hire another 70 employees this year. Some will work directly with users, but candidates for senior posts will be evaluated on the effect they have had on business operations.

While some of the demand for skills is internal, aerospace firms are increasingly outsourcing routine tasks. For example, McDonnell Douglas and Allied Signal have outsourced systems management to IBM's Integrated Systems Solutions Corp. (ISSC). ISSC project executives say the company always strives to expand its skills base.

"We manage all aspects of their computer environment, and we look for people with strong customer skills," says Andrea Roma, ISSC's project executive for the McDonnell Douglas account.

Some firms are even partnering with vendors and integrators to help existing staff work with new technologies. For example, The Boeing Co. worked closely with IBM and Dassault Systèmes, a French software company, to create the new digital design process used on the Boeing 777. Now that the system is in place, some of IS has been redeployed to implement the technology in other divisions. Meanwhile, Boeing recently announced 6,500 layoffs.

But whether you take a job inside or out, a diverse set of skills is considered key to continual redeployment on new projects.

"Engineers really have to understand the business process," says Larry Olson, director of IS for 747s, 767s and 777s at Boeing Commercial Airplane Group in Everett, Wash. "People who have managed other business tasks and have a customer orientation and a technical background can work at Boeing and other companies very effectively." ■

Seeking an IS job in aerospace? Learn Ada as well as C and C++. "Ada is needed for at least 80% of IS positions at McDonnell Douglas Aerospace, though most entry-level programmers don't learn the language in college," says James Diller, administrator of professional employment.

Most programmers learn Ada on the job, but internships are becoming increasingly available. For example, Embry-Riddle Aeronautical University in Daytona Beach, Fla., offers four-year programs for undergraduates that include two internships as well as course work in Ada, C and Unix.

Scanlon and Bermar work at Corporate Ink, a communications firm in Newton, Mass.

CAREER OPPORTUNITIES

Due to explosive growth, PCS GROUP has immediate Full-Time and Consulting opportunities for IS professionals with at least two years experience with the following technologies.

Client Server	Mainframe	MISC
	Cobol	
Sybase	CICS	Network Eng.
Sybase DBA	DB2 DBA	Clipper
Powerbuilder	DB2 Systems Prog.	Unix Admin.
C++	Telon	OS/2
ORACLE	IMS	
	Assembler	
	Natural/Adabas	

PCS GROUP offers excellent fringe benefits, training reimbursement, relocation allowance, and performance bonuses.

PCS GROUP
9300 Shelbyville Rd., Suite 1103
Louisville, KY 40222
800-682-9784, 502-339-2900
FAX 502-339-2888
Equal Opportunity Employer

SYBASE Partner

HARDWARE/SOFTWARE VENDORS

Salaries to $100,000

Outsourcing Mgr. Will manage outsourced systems group. Must have outsourcing mgt. experience.
OS Reliability, Availability Mgr Manage group directing RAS features for PC Operating Systems.
Project Mgr. Must have experience managing large development projects. Life Insurance or financial systems.
Communication Products Help develop/select communication products for laptop computers.
QA Multiple positions requiring strong hardware or software QA exp.
Development Programmers Multiple openings with clients around the country developing desktop and mainframe software products. Typical skills required include: C, C++, Smalltalk, PowerBuilder, IBM assembly.

APPLICATION DEVELOPMENT POSITIONS

Salaries to $75,000

DBA 1+ year Oracle, DB2, IDMS, ADABAS or SYBASE.
System Prog. 3+yrs MVS, DB2, IMS, VSE/VM or VTAM.
P/A Any combination of CICS, DB2, IDMS, ADABAS or Oracle.
AS/400 P/A RPG or Cobol, SYNON a plus.
EDP Auditors Degree, CISA or CPA a plus.
Banking Openings for P/A & Proj leaders.
Life Insurance PC or Mainframe exp. P/A and Proj Managers.
Mfg. Software Engineer - Manufacturing & Oracle, SQL & Windows.

ROBERT SHIELDS & ASSOCIATES
PO Box 890723 • Houston, TX 77289-0723
713/488-7961 • Fax 713/486-1496
email: ITJOBS@AOL.COM

CONTRACTORS

◆ INFORMATION SYSTEMS ◆
Oct. 1994 Avg. Rate $80/h

- LOTUS NOTES ADMINISTRATOR
- ORACLE MIDDLEWARE
- BUS. SYSTEMS ANALYST: CLIENT/SERVER
- SR. DBA, SYBASE
- COBOL, POWERHOUSE PROGRAMMER
- ALL-IN-ONE DEVELOPERS
- NOVELL/WINDOWS SUPPORT
- UNIFACE 6 PROGRAMMER/ANALYST
- SR. VB/ACCESS (WESTERN MASS.)
- SYSTEMS ANALYST: FINANCIAL SERVICES
- POWERBUILDER, ORACLE 7
- PROGRESS, UNIX
- ORACLE 7, SQL FORMS v4.0
- SYBASE, MS-WINDOWS, C
- ORACLE DBA
- C++, WINDOWS 3.1, WIN'95
- NT SYSTEMS ADMINISTRATOR

◆ SOFTWARE ENGINEERING ◆
Oct. Mid-Range Avg. Rate $105

O-O DEVELOPMENT
MAC, MACAPP, MPW

- VISUAL C++, MFC, NT, WIN 32 API
- VISUAL C++, MFC, IMAGING EXP
- C++, SYBASE API
- C++, WEB SERVER INTERFACE
- C++, WINDOWS, WINSOCK
- C++, UNIX, TCL, CLEARCASE
- VISUAL BASIC, SYBASE
- WINDOWS ARCHITECTURE [FROM UNIX]

O-O PROJECT MANAGERS

- O-O DISTRIBUTED SYSTEMS
- MULTI-PLATFORM COMPATABILITY (WINDOWS, UNIX, OS/2, NT, MAC)
- CADENCE [VERITIME]

Winter, Wyman ◆ Contract Services

617-890-7007
800-890-7002 OUTSIDE MA
FAX: 617-890-4433

E-MAIL: WINTER@WORLD.STD.COM
204 SECOND AVENUE, SUITE CW
WALTHAM, MA 02154-1126

Programmer/Analyst

International Bank of Commerce, a rapidly expanding financial institution in South Texas is looking for an experienced CIF Programmer/Analyst in an NCR/VRX environment for its Data Center located in San Antonio, Texas.

Requirements: minimum of 10 years experience in NEAT/3 level I and II, NEATVE, COBOL and NCR VRX utilities. Bank accounting and experience in all banking applications required.

Duties include: maintenance, enhancement, and support of all CIF-E1 batch and on line applications. Develop, install and support new mainframe applications as needed. Competitive wage and benefits offered.

Please fax resume with salary requirements to 210-821-4779 to the attention of Andres Alvarenga for immediate consideration, or call 210-821-4771 or mail resume to: 2416 Cee Gee, San Antonio, TX 78217

IBC, an EOE company

Pacific Northwest

PDG
Pacific Data Group

We have a proven track record of systems integration and information services consulting. Our 7 years of double digit growth and market leadership is due to our strong ethics, skilled employees and ability to offer top pay.

PDG offers an attractive compensation and benefits package. For immediate consideration, mail, fax or e-mail your resume to: Pacific Data Group, Inc., 10300 SW Greenburg Road, Suite 230, Dept C, Portland, OR 97223. Fax: (503) 293-3898. Tel: 503-293-2499
Internet: 70540.314@compuserve.com
Equal opportunity employer

- DB2, CICS
- IMS DB/DC
- IDMS/DC
- IDS/II
- COBOL, CSP
- Huron
- C/C++
- PowerBuilder
- Oracle v6/V7
- Oracle Forms
- Oracle Case
- Windows NT
- Visual Basic
- SQL Server
- SQL Windows
- HP3000
- BAD/BAD
- IET, ADW

SENIOR SOFTWARE ENGINEER Develop specifications, design parameters of proprietary and industry standard hardware and system software architectures. Perform analysis and conceptual design of UNIX operating system for single and multiprocessor (asymmetric and symmetric) server systems. Design, develop and debug of UNIX SVR4 subsystems and programming of subsystem device drivers. Create test plans, programs/environment for testing developed modules and submodules. Participate in the testing and evaluation of developed products, working with engineering test groups and standards compliance groups. Participate in the design and development phase of on-line supplemental manuals and documentation. Participate in system performance monitoring and printing activities. Assist support organization in answering field questions and help them to resolve complex and critical problems. Requires Bachelors Degree in Computer Science, Computer Engineering or an equivalent degree established by written evaluation. Requires minimum of ten (2) years experience as Computer Systems Designer and at least (2) years experience with the following technology: industry hardware standards such as ISA and EISA bus architectures, UNIX SVR4 kernel design and its architecture symmetric multiprocessing models and their architecture, DDI/DKI standards for device driver development, developing and testing device drivers for correct functionality. Requires at least 2 years experience with C programming language and assembly-language programming, usage of analysis and debug tools such as symbolic debugger (sdb), kernel debugger (kdb) and kernel crash dump analyser (scrash), Small Computer System Interface (SCSI) bus architecture, operation of the multi port terminal controllers, developing and designing on line and supplemental manuals and documentation relating to UNIX operating systems. Experience may be concurrent. 40 hours per week, 8:00 a.m. to 5:00 p.m. Salary $43,610 per year. Any applicant who is interested in this position may send a resume to: JOB SERVICE, ATTENTION: Pat Redington, Job Order #3060087, E.S. Staff Services - 5th Floor, 140 East 300 South, Salt Lake City, UT 84111. Please refer to the JOB ORDER NUMBER in your resume.

ASTECH CONSULTANT

Responsible for providing technical support to customers. Resolve customer problems as requested, provides on site technical support, research problems and assists on behalf of customer. Maintain customer's computer systems, review customer support requirements and provides solutions, analyze customer reported problems, perform support for customer requests while on site, operate customer computer systems and support equipment as required by customer, write status reports to management and customers, travel to customer sites as required. Proven experience in Tandem utilizing Pascal, C, Cobol, Scobol and Assembly programming language, software analysis and design, software program testing skills, BASE24 products, testing procedures skills, Word Perfect and database management. Must have B.S. B/A in Computer Science. 40 hour/week, $44,497.00/year. Must have proof of legal authority to work in the United States. Send your resume to Bernard Chikerlan, Nebraska Department of Labor, P.O. Box 94600, Lincoln, NE 68509. Refer to Job Order #NE 0129998. This advertisement is paid for by the employer.

CONSULTANTS
Immediate Interviews

MAINFRAME

DB2/CICS	• IMS	• ADSO
DB2 or CICS	• IDMS	• IMS
Natural 2	• Assembly	• VM
Tandem	• AS 400	• CASE
ADW or IEF	• CSP	• MBD or MBA
BAL	• APS	• PL1
NOMAD	• QMF	• SAP

CLIENT SERVER

Lotus Notes	• MAX/RDB	• Progress
PowerBuilder	• Informix	• Sybase
OLE 2.0	• Notes	• Pentium
Oracle	• Unix	• Vis Basic
Lan/Wan	• Sybase	• Smalltalk
Visual C++	• Access	• C++
Sys/Admin	• TCP/IP	• Mail
PowerBuilder	• Tuxedo	• Windows
Windows NT	• SAP	• System 10

Rahn Rogers Consulting
1212 6th Ave. 5th Fl. NYC 10036
800-621-5158 212-921-1310
Fax 212-302-4360
email: [illegible]@[illegible].com

Software Engineer 40hrs/wk, 9am - 5pm. $43,500/year. Design, develop, implement and test software applications, databases and networks. System implementation for various areas including resource sharing in networks and graphical user interface, GUI development Tools, C/C++ (OOP/OOD), UNIX (AIX) RDBMS (Informix), SQL, X-Windows/Motif, M.S. in Computer Science as well as one year experience as a Software Engineer or Programmer required. Previous experience must include C, UNIX or AIX, Informix SQL. Graduate education must include one project on GUI development using X-Windows/Motif. Submit resume to: Job Service of Florida, 2312 Gulf-to-Bay Blvd., P.O. Box C, Clearwater, FL 34619-4090. Re: Job order #FL-1247117

CONTRACTORS
ALL TECHNICAL SKILLS

NATIONWIDE REQUIREMENTS

We mail your resume to brokers nationwide at no cost to you. Send your resume to:

JKL Enterprises, Inc.
500 North College, Suite 108
Charlotte, NC 28202
or
1377 K Street NW, Suite 187
Washington, DC 20005
1-800-257-0945
(202) 543-1930
FAX: (202) 543-2230

DATA PROCESSING
Contract & Permanent Jobs:

- LAN / WAN Networking
- UNIX Sys Admin / Novell
- UNIX C / C++
- Smalltalk / PowerBuilder
- MicroFocus COBOL
- Sybase / Oracle / Ingres
- AS/400 / Tandem
- COBOL / CICS / DB2
- Multiple DBAs

ProTech Systems Group, Inc.
5545 Murray Road, Suite 300
Memphis, TN 38119
800-659-5166 Fax 901-767-9350

FLORIDA
Opportunities

- AS/400, RPG/400
- Unix, C++
- GUI, X/Motif, C
- System tester - Unix, C
- M204, PL/1
- HP 3000, COBOL, Image
- EDI, Gentran, MVS
- WICX 2.0, Data Integrity
- PowerBuilder, C++
- CICS, DB2, COBOL
- PVCS Endeavor on PC
- Oracle Financials
- QA Project Supervisor
- OS/2, C, PM
- COBOL, JCL, VSAM, Utilities
- S/W Engineer (326 platform) Waveform theory
- Adabas/ Natural
- Oracle DBA
- DB2 DBA - Mexico
- SQL Tuning DBA - Mexico

CBA
1811 N. Westshore Blvd.
Ste. 240
Tampa, FL 33607
(813) 287-2100 - FAX 287-2954

DIRECTOR
◆◆◆◆

We have been retained to conduct Director level searches for positions in Baltimore, Dallas, Denver. Experience should include 10-15 years Information Systems management. MS or MBA preferred. Big 6 consulting a + . Please forward resume and salary requirements to: Abacus Consultants, Inc. 1777 So. Harrison St. Ste 404 Denver, CO 80210 Attn: SJK Fax (303) 759-9046

TANDEM
COBOL, PATHWAY TAL, SCOBOL, C, SQL X 25
STRATUS
PL1, COBOL C/OPU2
MUMPS - UNIX
SUN, HP, RS/6000, GUI, SDK, PowerBuilder, C++, Visual Basic
Full-time/Consulting Positions available in the US/ABROAD
STRATEM
800-582-JOBS
TEL (212)967-2910
FAX (212)967-4205
124 W. 30th St. Suite #302
New York, N.Y. 10001

Sunbelt Opportunities

CICS/DB2 PA's ... TN, NC, FL, GA, VA
AS-400 P/A's ... TN, MD, VA, NC, TX
TANDEM PA's ... OH, NC, VA, TX
UNIX/C++ PA's ... NC, TN, FL, NY, AZ
PC/OS/2, C, P/A's ... NC, SC, AZ
ORACLE/SYBASE DBA's ... VA, CO, FL
DB2 CICS/MVS S/P's ... VA, TX, WA
Bank PA's ... AZ, AL, NC, TN, GA
POWERBUILDER PA's FL, NC, VA
CASE Tools S/A's ... NC, VA, GA, IN
SAP R/3's, S/A's ... Nationwide
EDP Auditors ... IL, TN, TX, AL, NC
PERMANENT FULL TIME POSITIONS
Some positions relocation assistance. Bachelor degree plus 3 years in MIS programming, over MIS applicants. Opportunities in the Southeast, Southwest & Midwest. Fax your resume today.
SUNBELT RECRUITERS
2336-400F E. Flamingo Road
Las Vegas, NV 89119 • (702) 369-7000
Attn: Rick Young, C.P.C.

Systems Analyst Fairway KS Design - develop implement & test applications using Lotus Notes, Lotus API ToolKit, Lotus VIP C/C++, Visual C++, Visual Basic and Windows SDK. Design & develop applications in Lotus Notes to interface with scanners. Develop programs using API ToolKit to download data from ORACLE into Lotus Notes Applications. Develop dynamic link libraries in C/C++. Provide full cycle Testing and Technical support to Clients. Prepare handbooks and on-line documentation to give users a detailed description about the applications and how to use those applications. Req'd M.S. in Computer Science. 1 yr exp in job offered. Must be a Certified Lotus Notes Consultant. 40hr/wk, 8am-5pm, $65,000/yr. Please apply with a resume in person to your local Kansas Job Service or send resume to: Dept of Human Resources, KS790540, Attn: Don Bruner, 401 S.W. Topeka Blvd., Topeka, KS 66603-3182. Must have proof of legal authority to work in the United States.

SYSTEMS ANALYST/PROGRAMMER Design, develop & implement software using UNISYS A Series mainframe computers & related software such as DMSII, COBOL, WFL & LINC II. Fourth Generation computer language in the area of health & life insurance. Customize, enhance, implement the total insurance processing solution (TIPS) product written in LINC II on UNISYS A Series mainframe computer. Develop programming standards, test procedures & conduct staff training. Salary $65,000 per year. 40 hour week (8:00 a.m. - 5:00 p.m.). Requirements: Master Degree or equivalent in Engineering. 6 months experience in related occupation as a Systems Analyst/Programmer. Experience must include the customization, enhancement & implementation of TIPS software on UNISYS A Series mainframe using LINC II. Apply at the Texas Employment Commission, Fort Worth, TX or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778. JO # TX6944652. Ad paid by an equal opportunity employer.

HP/UX SYS ADMIN

Vital Computer Services, a New York based information services firm is looking for Senior System Administrators.

Successful candidates must have a detailed knowledge of HP/UX internals and the ability to tune and rebuild kernels. Four or more years of HP/UX system administration and excellent verbal and written communication skills required.

Send resume to: Dept CW, VITAL COMPUTER SERVICES (NY), INC., 117 East 24th Street, New York, NY 10010. (212)-674-3400 • Fax (212) 529-5347. vitalny@aol.com

VITAL

Long Term Contracts

IBM Mainframe Skills
Systems Programmers
DBA's IMS or DB2
Cobol P/As IMS or DB2
IEF Sr. Analysts to Jr. P/As
ADW Jr. Developers

Other Platforms
Oracle Financials P/As
OS/2 Communications
UNISYS ALGOL P/A

Contract Skill Sets Corp.
Voice (508) 278-2822
Fax (508) 278-3721

PROGRAMMER/ANALYST (2 positions) 40 hrs/wk 8am-5pm $48,000/yr. Carry out analysis, design, coding and testing of s/w application systems on an IBM m/f utilizing IDMS, ADS/O, ADSA & COBOL II. s/w Req: Bachelor's degree in Computer Science or Electrical Engrng or Mechanical Engrng and 3 yrs experience in job offered or 3 yrs experience as Software Engineer and/or Systems Analyst &/or Computer Consultant. Req: work experience in analysis & design of s/w application systems on IBM m/f utilizing IDMS, ADS/O, ADSA & COBOL II. "Employer Paid Ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 98595.

Unisys & Unix
Nation-wide Positions
Permanent & Contractor!
Linc, Xgen, Algol, Cobol, Mapper, Dms, Tip, Masm, Oracle, Informix, C, C++, Data Comm, Administration
Unasyst PO 447
Morton, IL 61550-0447
800-458-8370
Fax 800-932-8370

CONTRACT PROFESSIONAL with THE LEADING EDGE UP TO $45/HR.

We have positions available in FL, WI, PA, MD, VA, DC, NC & SC with the following skills:

- ORACLE Developer
- IMS DB/DC
- CICS, VSAM, COBOL
- AS/400, RPG III
- Unisys A16, ALGOL
- Unisys 2200, COBOL, MAPPER
- PowerBuilder, Visual Basic

Send resumes to:
JPS, Inc.
850 N. Randolph St. #423
Arlington, VA 22203-4025
Fax 800-963-3039
Toll Free 800-633-0391 EOE

ORACLE DBA

Opportunity to set the rules for new database application. 3-4 yrs experience plus degree required. VAX and/or HP experience a plus.

ANDERSON/ WATSON
1872 Independence Sq., NE
Atlanta, GA 30338
Fax 404-394-2952

Manpower Technical Services, has current and upcoming contract/consulting openings for experienced personnel with expertise in any of the following:

C, C++, Unix	Smalltalk
EDI/Gentran	TCP/IP
Lotus Notes	Protel
Telephony-Centrex	Oracle
AS/400 RPG III	SQL/DS
OS/2	Ingres
DB2	CICS
IBM AS	Windows

MANPOWER TECHNICAL SERVICES
Dept. 27F, P.O. Box 2053
Milwaukee, WI 53201
(800) 558-6992
FAX (414) 332 0378

This Space for HIRE! CALL:

800-343-6474

in MA., 508-879-0700, ask for John Corrigan, Vice President Classified Advertising.

COMPUTERWORLD

Weekly. Regional. National.

And it Works!

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS...

Computerworld gives you large numbers of professionals who work in your industry.

When you're recruiting computer professionals, it's often important to find ones with experience working on systems specific to your industry. *Computerworld's* audience of over one half million is made up of the right people in every major industry.

INDUSTRY	COMPUTERWORLD'S AUDIENCE
Information Systems "vendor" companies (includes consulting)	**165,037**
Computer Manufacturer	**67,894**
large-scale systems	36,446
mid-range systems	49,590
PCs/workstations	53,379
Software Vendor	**100,012**
large-scale systems	44,865
mid-range systems	82,722
PCs/workstations	61,517
Non-CPU Computer Products Manufacturer	**24,401**
VAR/Dealer/Retailer	**22,685**
DP service bureau/contract	
DP services	42,231
Consulting/Planning	75,019
Information Systems "user" companies and organizations	**475,301**
Manufacturing (not computers)	**126,464**
Insurance	**69,501**
Healthcare	**76,548**
Banking/Financial Services	**83,985**
Government	
Federal/State/Local	**144,312**
Business Service (except DP)	**27,035**
Communications Systems	**31,729**
Public Utilities	**39,424**
Transportation	**6,735**
Wholesale/Retail Trade	**123,785**
Education	**70,764**

SOURCE: Skill Survey of Computerworld's Audience, August 1994.

To place your advertisement regionally or nationally, call John Corrigan, Vice President/Professional Development Division at

800/343-6474 ext 201
in MA 508/879-0700

COMPUTERWORLD
Where the qualified candidates look. Every week.

Cool change

You can find great change agents at every level of an organization — you just need to know where your power comes from

By Barbara M. Bouldin

Ten years ago, I enjoyed my first big win as a change agent. At the time, I was a project manager at AT&T Corp. assigned to introduce workstation application development tools to hundreds of developers.

Today, I'm vice president of research and development at a commercial software company, moving its core products into client/server technology. While it's a different industry and I'm higher in the ranks, I still struggle with the change agent's role.

Typically, change agents enable people to implement new ideas or technologies. These changes can be as small as implementing a plan to better serve customers or as large as bringing about a corporate vision.

Fortunately, many of the lessons I've learned have remained the same over the years. For example, no matter where you are in the corporate hierarchy, you're capable of bringing about change. Second, while power achieved through rank in a company is important when facilitating change, grassroots support is essential. Third, you can't make great leaping changes no matter who you are.

Here's how the change agent's role has evolved for me:

THEN: Influence was more important than the power associated with a high-ranking job.

After many years at AT&T, I was well connected. The information systems director and I served on the school board. I became friends with another manager based on a mutual passion for chess. My cousin worked in purchasing, and my neighbor was the firm's first PC trailblazer. All of these people were part of my informal network, and I never hesitated to call upon them to expedite change.

> Power legitimized by organizational position does not guarantee results. **Influence is the key.**

When the company implemented PC-based tools for analysis and design, we were developing MVS applications on mainframes using terminals. We needed to quickly obtain PCs, configure them and install the necessary software — a difficult task in an organization with a hefty bureaucratic process.

When I learned that the recommendation and purchase order were on the director's desk, I asked him at a school board meeting to expedite the paperwork. When the order hit purchasing, my cousin was on double alert to "baby it" along. In turn, I borrowed the PC guru from his boss (my friend) to jump-start our configuration and installation.

I cashed in chips whenever I encountered resistance. For example, when developers failed to see how development tools fit into our world, I created familiar examples.

In turn, the developers couldn't ignore my help and advice because it was well grounded in shared history and experiences. I had the personal power to steadily progress my change effort.

The result? I shortened the cycle by weeks without any power derived from position.

NOW: Influence is still the key.

Today, I face new challenges as part of a senior management team. We're in the midst of moving to a new generation of core products squarely centered in client/server. I have opinions on how to best leverage our technical excellence. Moreover, my position affords distinct advantages not available to me 10 years ago.

Now, I'm automatically granted a fair amount of "airtime" with executives and troops. Yet I must use that airtime as effectively as I did when I had little organizational clout.

To that end, I've spent many late nights developing a pragmatic reusable architecture. The objective is to develop a family of products that will guarantee a market advantage within the year. From there, I distilled the plan into a presentation to illustrate its value.

After securing the chief executive officer's approval for the plan, I turned my attention to mobilizing my own organization. As the leader, I made the goal and my vision of how to get as there unequivocally clear. But I remained a realist. People embrace change only if they have adopted the process as their own — no matter how high or low you are in the hierarchy.

I revealed the plan's details to managers and staff and gathered opinions, suggestions and finally acceptance. But it wasn't always easy to secure their willingness to accept compromise in the development process.

I made sure team members were given opportunities to understand the market considerations that drove the business as well as a chance to express their ideas. Eventually, we reached a consensus and created working models that included many homegrown constructs for development.

The result? While I had the clout to ruthlessly pursue change, I used my power to create an environment where everyone could influence the process. n

Bouldin is vice president of research and development at Softworks, Inc. in Alexandria, Va., and author of *Agents of Change: Managing the Introduction of Automated Tools* (Prentice-Hall, 1989).

We Offer A World Of Opportunity.

Technology Consulting, Inc. is a dynamic and rapidly growing Software Development Firm with challenging assignments. We are a leader in application outsourcing. Current client projects and our internal development center require the following skills:

CLIENTSERVER
C/C++ Visual Basic, Visual C++, MS Access, Oracle, Net, PROMS, Sybase, Powerbuilder, Windows, SQL NT, OLE, Power Builder

AS/400
RPG/400, COBOL

MAINFRAME
COBOL, CICS, IMS DB/DC, DB2, INFORMIX, EDI, Ingres, JCL/VSAM, NATURAL/ADABAS, PROW, EDGE/RAPID, ALIAS

Certified Netware Engineer/Administrator

UNIX Administrator

TCI offers competitive salaries, attractive benefits, and [illegible] For consideration, send resume to or call **502-589-3110.**

TCI TECHNOLOGY CONSULTING INC

1800 Meidinger Tower, Louisville, KY 40202, FAX [illegible]

MCMS Micron Custom Manufacturing Services, Inc

Come join the world-class team of Micron Custom Manufacturing Services where you will live in the beautiful Boise, Idaho area.

SYSTEMS ANALYST

RESPONSIBILITIES INCLUDE:
- Apply knowledge of business functions/systems technology to formulate, develop, and implement automated solutions on an ORACLE (V7) platform
- Perform all aspects of applications systems analysis: test planning, conversion planning, and implementation activities.

REQUIREMENTS INCLUDE:
- BS in Computer Science or equivalent experience required.
- 5+ years in business/systems analysis with strong emphasis on process improvement.
- 3+ years experience leading medium to large scale projects within an ORACLE arena
- Working familiarity of MS Windows, CASE, VAX VMS and Visual Basic a plus.

We offer competitive compensation and benefits. Relocation assistance is available. For immediate consideration, please fax your resume to 208 368 2789 or mail to

Micron Custom Manufacturing Services, Inc.
8455 Westpark Street
Boise, Idaho 83704-8366

Please include salary requirements. Principals only. EEO/AA

Business Analyst Position & SAP Analyst Position Now Available!

We're **SABIC** (Saudi Basic Industries Corporation) one of the largest petrochemical companies in the world and we earned a record profit of over $1.07 billion last year! Are you looking for a new challenge? Come join our team and put your creativity and skills to work in the Kingdom of Saudi Arabia!

Business Analyst Responsibilities will include researching, enhancing, designing, and implementing changes in SABIC's business and marketing process by determining current and future requirements. Experience in production planning, manufacturing, forecasting, and **SAP experience a plus.**

SAP Analyst Responsibilities will include determining current and future SAP requirements, and then implementing a SAP program within SABIC to improve the business and marketing process. **SAP experience is mandatory.**

The successful candidates have 8-10 years of experience with a masters degree in computer science and/or business administration/management with extensive experience in the business and marketing environment.

We offer attractive and competitive salary package. Some of our benefits include: relocation allowance, housing, life and medical insurance, annual home leave, transportation allowance, and education allowance.

Send resume and salary history to:

SABIC Americas, Inc.
Two Westlake Park • Suite 1600
580 Westlake Park Blvd. Houston, Texas 77079
Tel. No. 713-497-7776 • Fax No. 713 497 7898

Midwest

Management Information Systems Opportunities

A familiar name throughout the world, **Rubbermaid** has realized unprecedented success by providing a work environment where creative solutions are rewarded. You're invited to join our team and make an important contribution to our future, and your own. Rubbermaid Information Systems is looking for top performers for:

Database Administrator

This would be an excellent career move for an accomplished professional with 5+ years' experience as a DBA in an IDMS environment. **(Job Code D/A)**

Analyst/Programmers

Successful applicants will have at least 2 years experience in an MVS/CICS environment using COBOL or IDMS/ADSO. Highly desirable is experience with sales/marketing, distribution, manufacturing or D&B/MSA E-Series financial applications. **(Job Code A/P)**

Network Analysts

Qualified applicants will have 4+ years experience in large-scale network planning, installation and management with expertise in Novell 4X, NACS, and OS/2 3.X. **(Job Code N/A)**

We offer a competitive salary, superior benefits, including fully paid health care, tuition assistance and a unique Improvement Sharing Program. Wooster, Ohio offers a small college town atmosphere just 30 minutes from the Cleveland area. For confidential consideration, submit your resume with salary history, indicating job code to: **Ted Moore, Home Products Division, RUBBERMAID, INC., 1147 Akron Rd., Wooster, OH 44691-6000.**

We regret we can respond only to fully qualified candidates. No phone calls or agency referrals will be accepted (no exceptions). We comply with the Drug Free Workplace Act, and we are smoke-free M/F/D/V

Rubbermaid

Computer Professional

Fermilab, the world leader in high-energy physics research, is seeking a skilled professional to join the Databases and Information Department of our Computing Division in Batavia, IL.

Participating as a team member in the development of a business re-engineering project for the Computing Division, you will analyze, propose, test and implement solutions. The project architecture features a front-end, platform-independent C++ based GUI client (using the XVT class libraries) communicating over TCP/IP to a C++ based object server residing on a Sun server interfaced to an Oracle database using the product. Persistence.

You must have demonstrated ability to troubleshoot software problems in an object-oriented environment, a BS in Computer Science or a related field (or equivalent experience) and knowledge of Oracle 7 and C++. Additionally, five years experience in database technology is required, developing and implementing solutions to data-management problems involving C++ and Oracle.

Fermilab rewards expertise with an attractive salary, comprehensive benefits and long-term opportunities for professional growth. Forward your resume to: **James L. Thompson, Employment Manager, FERMI NATIONAL ACCELERATOR LABORATORY, P.O. Box 500, Batavia, IL 60510-0500. E-mail: employ@fnal.gov.** Fermilab is an equal opportunity employer m/f/d/v.

Fermilab

Senior Software Engineer required at computer game company to engage in research and development for interactive computer games software including (1) proprietary programming in the following languages and systems: C, Objective C, C++, NEXTSTEP, Unix, AGL, Display Postscript, Real Time Communications and DOS; (2) developing new languages and software; (3) developing three-dimensional graphics systems, 3D model and scene generators, artificial intelligence, natural language (English) systems, simulation engines, graphics tools and other proprietary utilities; (4) Appraising third-party products and negotiating product development and improvement and (5) determining configurations for high-end production tools; (6) reviewing demonstrations and submissions from developers and artists. Qualified individual will have a B.Sc. in computer science and two years experience in the job offered. In addition, the individual must have participated in the design development of copyrighted commercially successful computer game product. Salary $52,500.00 per year for a 40 hour work week, 9:00 a.m. to 5:00 p.m. Must have proof of legal authority to work permanently in the U.S. Resume to Illinois Department of Employment Security, 401 South State St., 3 South, Chicago, IL 60605. Attention: Brenda Kelly. Reference #V-IL-12841-K. NO CALLS. AN EMPLOYER PAID AD. SEND 2 COPIES OF RESUME.

Software Engineer, 40 hrs/wk, 8 am-5 pm, $35,000/yr, overtime as needed, not compensated. Job requires: Bachelor's degree in Computer Science or Electrical Engineering and 6 mos. experience in Job Offered or as Programmer (on-campus, university exp acceptable). Job also reqs: 1) Exp must include exp developing database applications; 2) Exp must include exp developing design specifications, implementing code (both database manipulation & user interface), testing applications, & delivering applications to the field; 3) Exp must include exp programming in Foxpro; 4) Exp or coursework in which individual programmed in C; 5) Exp or coursework in which individual programmed window based (Microsoft Windows, X Windows, or MOTIF) user interfaces; & (6) 1 college course covering finite state machines. Any exp reqs may be met during the same 6-mo period. Job duties: Specify, design, develop, test & release complex database application software, primarily in a Microsoft Windows environment. Use Foxpro, C, & other programming languages. Responsible for both the data manipulation (using finite state machines & set theory) of the applications & the associated graphical user interfaces. Projects will be both to develop products corporation delivers to its customers & to implement internal corporate database systems. Qualified applicants should send resume & verification of reqs to: 7310 Woodward, Rm 415, Detroit, MI 48202. Ref #98895. Employer Paid Ad.

PREMIER SYSTEMS, a successful information systems company, has an immediate need for experienced Consultants with any of the following skills:

- **PMSC-SERIES III**
- **OS/2 Comm. Manager**
- **HOGAN-OTP**
- **DB2-DBA**
- **MF-COBOL/UNIX**

Please call or send resume to: Mr. Tariq Khan, PREMIER SYSTEMS INC., Two Mid America Plaza, Suite 800, Oakbrook Terrace, IL 60181. Phone: 708 575 2944. Fax: 708 674 6826. (eoe)

GROUPWISE SYSTEMS ADMINISTRATOR

Cleveland Based
National Law Firm

Day-to-Day Administration and Troubleshooting of E-Mail System on 1,000+ User WAN

LAN Server & OS/2 2.1 Plus
Minimum 1 Year Experience

Send resume to:
Baker & Hostetler
ATTN: Firmwide HR
3200 National City Center
1900 E. 9th Street
Cleveland, Ohio 44114-3485
FAX 216-861-7904

Computerworld makes your positions known.

When you have positions to fill - and you want to tell the nation's top talent about them - *Computer world* is your best choice.

That's because *Computerworld* places your message in front of over one half million qualified computer professionals every week. And you can choose to deliver your recruitment message regionally and nationally.

To place your advertisement, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700), ext. 201.

COMPUTERWORLD

Weekly. Regional. National. And it works.

DATA PROCESSING

TOMORROW'S TECHNOLOGY TODAY AT YTS

It's your career. Shouldn't you be working with a company that's going to help you move into the future? Yellow Technology Services is dedicated to helping employees take charge of their careers through cross-training, varied project assignments and an advanced Learning Center.

PROGRAMMERS/ PROGRAMMER ANALYSTS

As a member of our cross-functional team, you will utilize state-of-the-art tools and master new technologies in a project oriented setting that emphasizes flexibility and continuous improvement. We will rely on you to develop, analyze, program and test computer programs on schedule and in compliance with specs and standards. Our qualified candidates will have experience with client/server technology. Specifically, we seek individuals with a minimum of 2-3 years experience in skillsets that include CICS, C and COBOL II.

YTS offers an excellent salary, generous benefits, and a variety of challenges that lead to professional growth. Qualified candidates are encouraged to send a resume to: **Technical Recruiter, YTS, Inc., P.O. Box 7950, Overland Park, KS 66207-0950.** An Equal Opportunity Employer

YELLOW TECHNOLOGY SERVICES, INC.

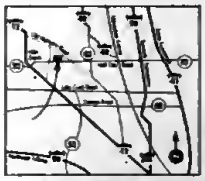
YTS
A Yellow Corporation Company

OPEN HOUSE

INFORMATION SYSTEMS PROFESSIONALS'

SAT., JUNE 17th, 10:00 am - 2:00 pm

LEADING EDGE SOLUTIONS TODAY!



LONG GROVE:
One Kemper Dr., at Route 22 (Half Day Rd.)
Building 3 (8 miles west of the Tri-State Tollway)

At Kemper National Insurance Companies, we successfully combine our outstanding resources to better serve our employees and customers internationally. Our dedication to effective teamwork, premier service and quality products has made us a world class property-casualty insurance leader for 80+ years. If you are an innovative thinker seeking a progressive future and the opportunity to work with state of the art and cutting edge technology, we invite you to explore the exciting opportunities available at our Long Grove International Corporate Headquarters. Help us shape the future of insurance information systems.

The selected candidates will possess a Bachelor's Degree (or equivalent), a minimum of 2 years data processing experience with excellent communication skills. Experience in the following areas is highly desirable **OS2, UNIX, C, C++, UNIFACE, IMS/DB2/CICS, LOTUS NOTES, SQL, MICRO FOCUS COBOL/2, INGRES, VSAM, EASYTRIEVE PLUS, COBOL II, HURON, DATA MODELING, GUI BASED SYSTEMS, OBJECT ORIENTED and DATABASE DESIGN/DEVELOPMENT.**

- ▲ I.S. MANAGERS
- ▲ DESIGNER ANALYSTS
- ▲ PROGRAMMERS
- ▲ DATABASE ADMINISTRATORS
- ▲ DISTRIBUTED DATA PROCESSING LAN SPECIALISTS
- ▲ LOTUS NOTES LOTUS SUITE SUPPORT SPECIALISTS

You will also have the opportunity to meet with several IS Managers to discuss our sophisticated technology company objectives, departmental information and the various career paths available. Our Information Services consist of 800 employees who effectively combine their ideas to provide superior service/support for worldwide insurance activities.

As an integral member of our $3 billion leading edge corporation, you will enjoy an excellent compensation package including: life/health/dental insurance, profit sharing, retirement plan and a full service fitness center nestled on a world renowned P.G.A. golf course. You will also have the unique opportunity to achieve your personal and professional goals through our extensive training and career development programs.

If you are unable to attend the Open House, please forward resume with salary history to: **Human Resources, KEMPER NATIONAL INSURANCE COMPANIES, One Kemper Drive, Long Grove, IL 60049-0001. FAX: (708) 320-5624. (AA/EOE)**

Kemper national insurance companies

Kemper National Insurance Companies is not part of the Kemper Corporation Zurich Announcement

MAJOR CLIENT/SERVER PROJECTS!

To stay ahead of the technology curve, Keane offers the only solution the advantage of experience! Keane, a $350 million software services company, can help you stay ahead of the curve through a variety of projects, training and rapid growth. We are currently in need of IS Professionals to join a number of **LARGE SCALE POWERBUILDER/SYBASE DEVELOPMENT PROJECTS!**

Candidates must possess solid technical experience in leading and/or using prototyping techniques. Make your next career move your best!

KEANE

Tom Bell
KEANE INC
901 Warrenville Rd.
Suite 220
Lisle IL 60532
PHONE 800 79 KEANE
FAX (708) 562-5787

Programmer Analyst 40 hours per week 8:00 a.m. to 5:30 p.m. $44,000 per year. Analyzes client needs and translates the needs into computer software design requirements. Programming using Microsoft Visual Basic for Windows and Magic PC. Developing database management systems using Microsoft sequel server. Binove record manager. Writing and executing unit test plans, system implementation and customer support. Knowledge of Platinum accounting software is required. Must have knowledge of Platinum Accounting software experience, Microsoft Visual Basic, Database management systems development, experience, Magic PC, Microsoft sequel server and Binove record manager 6 years of college. Master of Science Degree in Computer Sciences is required. Must have two years of experience. Must have proof of legal authority to work permanently in the U.S. Applicants must send resumes to: Illinois Department of Employment Security 401 S. State Street, 3 South, Chicago, Illinois, 60605, Attention Ruth Daniels. Reference #V IL 12974 R. No calls. An employer paid ad. Send 2 copies of resume.

Systems Analyst to analyze user requirements, procedures & problems to automate processing or improve existing computer systems, analyze current operational procedures, review computer system capabilities, determine if requested program or program change is possible within existing system, study existing systems to evaluate effectiveness, develop new systems to improve production as required, analyzing, designing, programming, testing complex business applications, design, develop & implement tape lease application system on IBM 3090 using COBOL, JCL, TSO/ISPF & CICS. Reqs. Bachelor's in Bus. Admin. Comp. Info. Systems or Comp. Sci. 2 yrs exp in job offered or 2 yrs related exp such as Programmer/Analyst or Sr. Systems Analyst. Must have exp in data processing in IBM mainframe IBM 4341 & 4331 under OS/MVS & OS/VSE system development cycle including implementation & user support such as COBOL, VSAM & JCL business/commercial applications including payroll, insurance & financial accounting systems development using MS-COBOL, COBOL, UNIX & DOS environments. $44 000/yr. 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave. Room 415, Detroit, MI 48202. Ref. #98295 "Employer Paid Ad"

SOUTHEAST

Work and play in one of the most desirable areas:

beaches • mountains
lower cost of living
year-round golf • lakes

- Client Server
- Mainframe
- Networking

ACP

Salaried•Full Benefits•401(k) Referral $

American Computer Professionals, Inc.
P.O. Box 11159
Columbia, SC 29211
800-633-8227
Fax: (803) 779-1955
(803) 256-3222
Internet: ACP@SCSN.NET
equal opportunity employer

SOUTHEAST

Join Computer Consulting Group, one of the Southeast's most dynamic consulting firms, and watch your career soar. We are seeking talented and motivated programmer analysts and have immediate staff openings through our offices in Richmond VA, Raleigh and Charlotte NC, Greenville and Columbia SC. Our immediate and continuing needs are:

- CSP/DB-2
- INGRES
- SAS/UNIX
- FRAMEMAKER
- Natural Adabas
- Windows NT/WFW Specialist
- Lotus Notes
- Project Manager/ MS-Project
- Oracle Programmers
- PC/Network Specialist
- AS400/RPG III
- VAX/Fortran

CCG offers competitive salaries, attractive benefits, relocation assistance and MORE! For immediate consider, fax send resume or call NOW!

Computer Consulting Group
Contract Professional Services

One Monckton Boulevard
Columbia, SC 29206
1-800-222-1273 • FAX (800) 539-3339
Member NACCB

Midwest

PROGRAMMER ANALYST (2 openings) (Ref 44495) to consult with clients to ascertain and define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze, design, develop & implement computer software for clients. EDP systems, analyze, design & develop software systems for the taxation & revenue processing of the oil & gas industry. Responsibilities include requirement analysis, logical modeling, defining automation boundaries & drawing of a physical model of the system developing programs using a relational database & an on-line data communication system working on IBM 3090/ES 9000 using MVS/ESA, DB2, CICS & CLISTS, also using COBOL, developing software in PC environment. Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer/Programmer/Analyst, Systems Analyst, Software Engineer, Software Programmer, Software Consultant or Consultant. We accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp. Must have some related exp in each of the following: Design, develop, analyze & implementation & using IBM PC, COBOL & CICS. $44,000/yr 40 hr/wk, 8:30a-5p.

PROGRAMMER ANALYST (2 openings) (Ref 81995) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze, design, develop & implement computer software for clients. EDP systems design & develop Graphical User Interface of Underwriter Processing System (UPS), database support & system testing using Windows SDK, Visual C++, Visual Basic, Microsoft Foundation Classes, Microsoft SQL, ODBC, MS Access, ENLLAPI Windows Communication Library, WinRunner, OICs OS/2 APPC & PVCS. Application development using ODBM, & OLE. Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analysis, or its equiv & 1 yr exp in job offered or 1 yr related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer or Consultant. We accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp. Must have some related exp in each of the following: Design & development of Graphical User Interface database support, and using Windows SDK, Visual C++, Visual Basic, Microsoft Foundation Classes, OLE, ODBM, & Microsoft SQL. $41,130/yr 40 hr/wk, 8:30-a-5p.

PROGRAMMER ANALYST (2 openings) (Ref 86795) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze, design, develop & implement computer software for clients. EDP systems, analyze, design & develop a full fledged integrated reinsurance sys. The responsibilities include user interaction, process flow & data flow design, develop logical data modeling & physical data modeling, data analysis, bringing out the data definition language, technical support & overall design of the sys. Developing applications in Client Server Architecture, using IBM 3090, IBM 486, MS WINDOWS, MS VISUAL C++, MS VISUAL BASIC, MS SQL SERVER, C, COBOL, WINDOWS COMMUNICATION LIBRARY PRODUCT SET (WCL/CFG-QuickFRONT Generator, WCL/ESO-Enterprise Server Generator, WCL/ESO-Enterprise Server Option, WCL/SDO-Software Distribution Option), PVCS. Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analysis or its equiv & 1 yr exp in job offered or 1 yr related exp as a Programmer, Systems-Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Analyst Programmer or Consultant. We accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp. Related exp must include each of the following: Development & implementation of systems built on Client-Server Architecture using Microsoft SQL Server, MS-Windows, Microsoft Visual Basic & Microsoft Visual C++. $42,900/yr 40 hr/wk, 8:30a-5p. Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202 & include Ref # Employer Paid Ad.

Programmer/Analyst. Analyze, design, develop, code, test, debug, and implement database, archive software in C and C++ on a Macintosh PC environment. Will use Object-Oriented programming techniques for expert systems, an asynchronous I/O and multi-threaded environment, including design of appropriate graphic interfaces using SQL. Uses software systems portability techniques to transfer data from one system to another, insuring data storage integrity. Requires M.S. degree in Computer Science. Education to include completion of one project in each of the following: (1) design of software using object-oriented programming, (2) design of an I/O interface card, (3) development of a program in C++ and Object Oriented LISP or SQL in a Macintosh environment. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week, at $39,000 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send two copies of resume to: Illinois Department of Employment Security, 401 S. State St., 3 South, Chicago, IL 60605, ATTN: Sheila Lindsey, Ref #V.IL.12891. L. No Calls. An Employer Paid Ad.

SYSTEMS ANALYST. Analyze, develop, program and implement an Accounts Management and Cost Accounting system. Test and implement online and batch software on mainframes and PC's. Req'd: Bachelor Degree in Computer Science or Accounting. 2 yrs exp in position offered or 2 yrs exp as Software Analyst. 2 yrs exp must include work on IBM mainframe and PC's using IMS, DB2 and ORACLE or SYBASE data bases and SQL, COBOL, COBOL II, TSO/ISPF, JCL, SPUFI, VSAM software. 40 Hrs/Wk, 9am - 5 pm, $34,000/Yr. Only persons with authorization to work permanently in the U.S. need to apply. Submit resumes to: Mary Faulbee, Department of Employment Services, 275 E. Main Street, 2W, Frankfort, KY 40621. Must refer to JO# 0345366. Equal Opportunity Employer.

SOFTWARE ENGINEER. Design, develop, evaluate and maintain complex software in Pascal Basic and C++. Develop and troubleshoot extensive application software involving inter-process and inter-computer communications between machines connected on DEC-NET. Utilize MS-DOS, MS-Windows, DEC Windows, OS/2, VAX/VMS and PDP 11 in application development. Requires a Bachelor's Degree in Electrical Engineering, Computer Science or Mathematics and 1 year experience as a Software Engineer or Computer Programmer. Requires 1 year experience with relational databases, memory management, Basic, Pascal, C++, MS-DOS, MS-Windows, DEC Windows, OS/2, VAX/VMS, PDP 11 and DEC-NET. 40 hrs/wk, 9-5, $34,000/yr. Employer paid ad. Resumes to: 7310 Woodward Avenue, Room 415, Detroit, MI 48202. Reference #65795.

SOFTWARE ENGINEER. Analyze, design, program and implement the application components of a Materials Requirement and Planning system for client server environments and test and implement software for corporate clients using RS/6000, IBM PC with SYBASE and T-SQL, APT SQL, C software. Reqd: M.S. in Engineering or Computer Sci. 2 yrs exp in position offered or 2 yrs exp as Software Engineer. 2 yrs exp must include the following: a) work in RS/6000 or any PC networking environment using SYBASE or ORACLE databases. b) Application development in a manufacturing accounting or any production planning system utilizing T-SQL, C, SQL, VI, AIX or UNIX. 40 Hrs/Wk, 9 am - 5 pm, $34,000/Yr. Only persons with authorization to work permanently in the U.S. need to apply. Submit resumes to: Mary Faulbee, Department of Employment Services, 275 E. Main Street, 2W, Frankfort, KY 40621. Must refer to JO# 0345395. Equal Opportunity Employer.

AVAILABLE IMMEDIATELY

ICOS is a software consulting, contracting, and development firm providing solutions to Fortune 500 Clients in Ohio. We are actively seeking consultants with at least 1-2 years of experience in UNIX/C environment for the following positions:

Job Code: Desired Background:

1-AT-0605: Software system testing & verification w 1-3 yrs rel exp in UNIX & C. Several positions available.

2-AT-0605: Software design/architecture and development positions requiring exp in UNIX, C++, Oracle and/or Sybase. Exp in data networking and/or system testing desirable.

3-AT-0605: GUI development positions requiring exp in WINDOWS API and Microsoft Foundation Classes, and C++. Knowledge of Windows NT and/or Windows 95, administrative mechanisms with MS Windows based applications, OLE Custom Controls (OCXs) are desirable.

4-AT-0605: UNIX System administrators, especially on HP Platform. Exp in TCP/IP, X.25, network communications. Sun OS/Solaris are desirable.

5-AT-0605: Software development position requiring exp in HP Openview OASM and/or CORBA standards, & familiarity with HP, SUN, and AT&T OS hardware.

6-AT-0605: Systems Engineer with background in C, C++, OO programming, OO Analysis & HP Openview (desirable). Similar exp required for several other software development positions.

7-AT-0605: Software development, software testing and systems engineering positions with exp in networking areas, such as CMIP, OSI, & X.25 in UNIX/C environment. Several positions available.

8-AT-0605: Software design/development and testing exp on Windows NT, Microsoft SQL, and Visual C++.

We offer a highly competitive compensation and benefits package. Send your resume & expected salary to **ICOS Inc., 1275 Kinnear Road, Columbus, OH 43212.** Please clearly ID the **Job Code** on the envelope. All positions are in Columbus, OH. EOE

COMPUTER SYSTEMS SPECIALIST Technical support for computer systems, knowledge of Foreign Trade Zones, Customhouse Brokerage and Duty Drawback. Systems required. Duties include comprehensive database management, design & maintain software including tutoring personnel, technical support for project planning and development, upgrading of equipment. Experience with Novell, C&-Clipper 5.0x, C-Language DOS & Windows Systems. Requirements: Bachelors in Computer Science, Mathematics & Systems Analyst-minimum 5 yrs exp. Hours 8:00am - 5:00 pm, 40 hrs/wk. Overtime as needed. $42,267.40 per year. Send resumes to: 7310 Woodward Ave, Room 415, Detroit, MI 48202. Reference No. 84095. Employer Paid Ad.

DP STAFFING SINCE 1969
PERMANENT, FL, CONTRACT

Sr Sybase DB Manager	$85K
Proj Mgrs Oracle OOD	$65K
S/A Cobol Unix I SAM	$55K
S/A's Andersen OCS	$55K
DBA's DB2 & Oracle	$65K
P/A's C++ Win, Unix, OS/2	$55K
Oracle 7 / Powerbuilder	$55K
S/A's Oracle Financials	$55K
P/A's Unix C Informix	$40K
P/A's MVS DB2 CICS	$60K

AVAILABILITY, Inc. Dept C
P.O. Box 2434
Tampa, FL 33622
(813) 315-8900 Fax 298-8674

BANKING NEEDS

DBA ORACLE 7.0 UNIX	60K
SYS PGMR VTAM/VCP	50K
P/L CLIENT SERVER EXP	60's
P/A COBOL CICS	65K
(and 20 positions)	
P/A APS DB2 CICS	40's

OTHER NEEDS

SYS PGMR DB2 CICS	60's
DBA CINCOM SUPRA	60K
DP MANAGER AS/400 RPG	40's
P/L SYBASE POWERBLD	60's
P/L MRP APICS CERT	60K
CONTRACTORS AS/400	

AMERICAN PERSONNEL, INC.
P.O. BOX 667386
CHARLOTTE, NC 28266-7386
(704) 398-1899
FAX (704) 529-1027

Systems Engineer: provide tech prod support to customers & acct execs, answer tech inquiries/dev sys demos & train customers & their staffs, dev & conduct tech training for acct execs, analyze tech aspects of RFPs, RFIs & RFQs. Bach or equiv foreign ed in comp sci field, & 3 yrs specialized trng &/or work exp, may be substituted for ea. yr of coll, one may lack & 2 yrs exp in job offered or in programming/analysis. Exp. must include NATURAL Programming Lang. & ADABAS PREDICT & COMPLETE software prods. $52K. Job in Bloomington MN area. Resumes to P.O. Box 3125, Reston, VA 22090.

Control Dsgn. Prefm Allen Bradley 5 Modicon 984 SLC 501/502 ladder logic program of PLC on-line debugging, electric welding safety, ABB & FANUC Robot control sys design & on-line debugging. Servo control sys design on-line debugging, hydraulic & pneumatic sys design on-line debugging. Panelview, PanelMate, PMD180, PMD300 program on-line debugging. AutoCAD 12 drawing for control sys design. Req MS in Elect Eng or Physics. 2yr exp in job offered or related area, must 3mon in Allen Bradley 5 SLC 501/502 ladder logic program, on-line debugging, 20mon in PLC program. AutoCAD drawing for control sys dsgn. 40hr/wk 8-5pm. $20/hr. Employer paid ad. Send resumes to 7310 Woodward Ave, Rm 415, Detroit, MI 48202. Ref No. 102095.

SYSTEMS ANALYST. Analyze user reqs, design, develop, implement financial and information systems on IBM/MVS hardware using CICS, DB2 and COBOL II. Define and establish DB2 database structure. Prepare program specs and systems docs. Enhance/debug existing systems and programs. 40 hrs/wk, $48,000/yr. Req: Bachelor in Computer Sci/Applications or Math & 2 years experience. Must have proof of legal authority to work in the United States. Send your resume to: D.E.S. Workforce Center, P.O. Box 729 (800 7th St. SE), Cedar Rapids, Iowa 52406-0729. Refer to Job Order IA 1100373. Employer paid advertisement.

Results.

Computerworld gives recruitment advertisers results. Weekly. Regionally. And Nationally.

To place your advertisement, call Lisa McGrath at 800-343-6474 extension 201, in MA 508-879-0700.

Weekly. Regional. National. And it works.

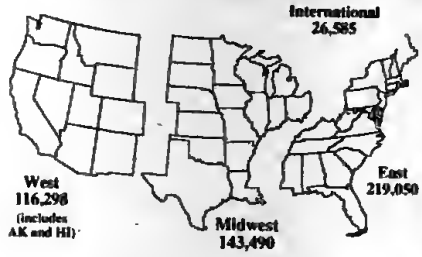
An IDG Communications Newspaper

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS...

Computerworld gives you the unique option of REGIONAL or NATIONAL recruitment advertising.

Whether you want to place your advertisement in the Eastern, Midwestern, Western, National, or any combination of regional editions, *Computerworld* gives you the only regional recruitment advertising section available in the United States designed exclusively for I.S. professionals. And no other newspaper or magazine reaches so many qualified computer professionals regionally or nationally!

Computerworld's Regional Editions and Readers

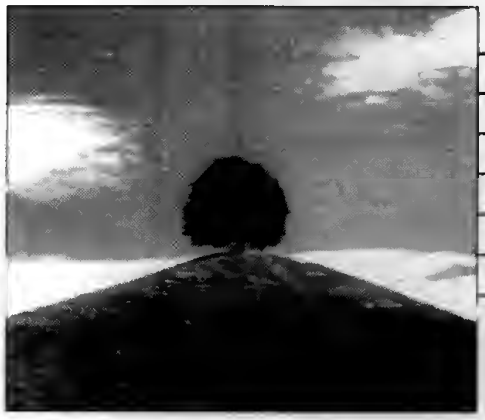


To place your advertisement regionally or nationally, call John Corrigan, Vice President/Professional Development Division, at 800/343-6474, in MA 508/879-0700 x201.

COMPUTERWORLD
Where the qualified candidates look. Every week.

IN A FIELD OF MANY, ONE STANDS ALONE

Capital One is the nation's fastest-growing credit card issuer and a company that's brought to market a brand new standard in information-based technology. We've had a growing impact on industry-wide innovations for 42 years running, and we continue to branch out and explore newer, bolder ways to shape the future of information technology.



Our roots go back to 1953, but our commitment to technology forges on. It is evidenced by our exciting IS environment: multi-tier base with multiple platforms including computer telephony and integrated imaging capabilities, a new fiber optic wide area network that connects to multiple Unisys mainframes (A-19 and A-15), two Amdahl 1400s, a Tandem Computers Himalaya scalable parallel computer, eight HP 9000 T500 database servers, several Sun servers and 3,000 PCs. Our technology has never been more advanced, and the time has never been better for IS professionals to stand out with us.

PROJECT MANAGERS
TECHNICAL ARCHITECTS
ANALYSTS
DEVELOPERS
TECHNICAL SPECIALISTS
DATABASE ADMINISTRATION
OPERATIONS

Consider these outstanding opportunities now available at Capital One in Richmond, VA and the metro Washington, D.C. area. Imagine the growth you could experience with a firmly rooted, flourishing company that stands alone in its industry and its rewarding team environment. Now explore the opportunities that will make it happen. Send, fax or e-mail your resume to: **Capital One, Attn: Human Resources, Dept. 7ADCOW1, P.O. Box 26349, Richmond, VA 23260-6349. Fax: (804) 346-3383. Email: jobs@capitalone.com (ASCII only).**

Capital One℠

Where Information Builds Success.

We are an equal opportunity employer committed to diversity in the work place.
We promote a drug-free work environment.
Trademarks are registered in their respective companies

We Put A Monster On The Internet

Imagine What We Can Do For Your Career

The Monster Board is the on line solution to finding your next job! A user friendly site on the Internet, The Monster Board is an innovative career search service which enables job seekers to select and apply directly on line in minutes. And it's absolutely free! Our extensive database includes rewarding career opportunities throughout the United States and Canada in the companies that you want to work for! There are 100's of jobs in these areas and many more!

- **Client-Server Architects**
- **Client-Server Developers**
- **Client Support Analysts**
- **Database Architects**
- **DBMS Engineers**
- **Lead Software Engineers**

Post your on-line resume to "Resume On-Ramp", where the top hiring companies come to search our database

Make your next career move on The Monster Board today!
Visit us on the World Wide Web at:
http://www.monster.com

Will Your Company Grow As Fast As You Do?

Lots of companies promise rapid career growth, but how can your career grow if your company doesn't?

Working for an organization that's growing every year means there's more room for your career to develop. It's that simple. It's Andersen Consulting's story – and its future.

And that's why we're looking for you—people with world-class technical and business expertise to work with our world-class clients. Ask where our Vision is taking us. Then tell us where you'd like to be.

It's a good time to take a new look at *Andersen Consulting*.

ANDERSEN CONSULTING
ARTHUR ANDERSEN & CO. SC

Send or fax your resume to Andersen Consulting at one of the following locations:

Central Region: 33 West Monroe St. Box CW595, Chicago, IL 60603 or fax (312) 921-3765

Pacific Region: 633 West 5th St., Ste. 2700, Box CW595, Los Angeles, CA 90071 or fax (213) 614-6904

Northeast Region: One International Place, Box CW595, Boston, MA 02110 or fax (617) 439-9729

South Region: [illegible]

© 1995 Andersen Consulting. An equal opportunity employer

SENIOR SOFTWARE DEVELOPERS

Ready to push the technology envelope and build the future? So are we! TRW has multiple openings for **Senior Software Developers** to support TRW's dynamic Automotive Information Services business. We seek qualified candidates for these newly created positions to design, develop and implement new systems and products in a multi-platform environment.

Successful candidates must be creative, resourceful, good communicators, and have 5+ years experience designing and developing application systems in an MVS/COBOL/DB2 environment. UNIX/C/Oracle, business process reengineering and project planning/management experience is a **definite** plus.

TRW is a leading provider of list and computer services to the direct marketing, financial services and automotive industries. We offer excellent compensation, benefits and relocation packages in a professional, fast-paced working environment exploring the power of cutting-edge technology!

TRW is located in a low cost-of-living/high quality-of-life suburban area 15 miles north of Dallas where housing is inexpensive and there are **NO** personal income taxes. **For immediate consideration, please send your resume and salary history to: TRW Information Services, Human Resources, 701 TRW Parkway, Mail Stop AC-1, Allen, TX 75002.** An Equal Opportunity Employer

TRW

Systems & Software Engineers

Send your resume today!

Let us introduce you to an industry leader to explore opportunities in Systems and Software Engineering. Our client is setting the pace in R&D, system-level architectures and planning for the next century. Knowledge Workers, Inc. has been retained to identify qualified candidates who want to play a key role in these efforts throughout the U.S.

Systems Engineering
- Communications (Voice/Data)
- ATM/Sonet
- RF/Satcom
- Trade Studies/Analysis
- Imagery
- Telemetry
- TT&C
- LAN/WAN
- Systems Architecture Development
- System Test
- ELINT/SIGINT
- Digital Voice/Video Networks

Software Engineering
- Communications Software, Networks, Protocol
- Signal Collection and Processing
- Unix
- C/C++, Pro C
- Object Oriented Analysis & Design
- Client-Server Architecture
- Network Management
- DCE
- Oracle/Sybase DBMS
- GUI Builders
- Case Tools
- Microsoft NT

Up to the challenge? Come join Knowledge Workers, Inc. and its client company to stake your claim to real career opportunities in the high-tech marketplace. Please fax or mail your resume to: Knowledge Workers, Inc., 8150 Leesburg Pike, Suite 1100, Vienna, VA 22182; FAX: (703) 827-0716. Representing an equal opportunity employer

Knowledge Workers Inc.

Looking for qualified computer professionals?

More than over one half million computer professionals read *Computerworld* every week. And you can reach all of them – or just the ones in your region – with a regional or national recruitment advertisement in *Computerworld's* Computer Careers section.

For more information, call Lisa McGrath at 800-343-6474, x 201 (in MA, 508-879-0700); or call your local sales office listed below:

Look no further

BOSTON
Nancy Percival
375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171, 508-879-0700

NEW YORK
Marty Finn
Mack Center 1, 365 West Passaic St.,
Rochelle Park, NJ 07662, 201-587-0090

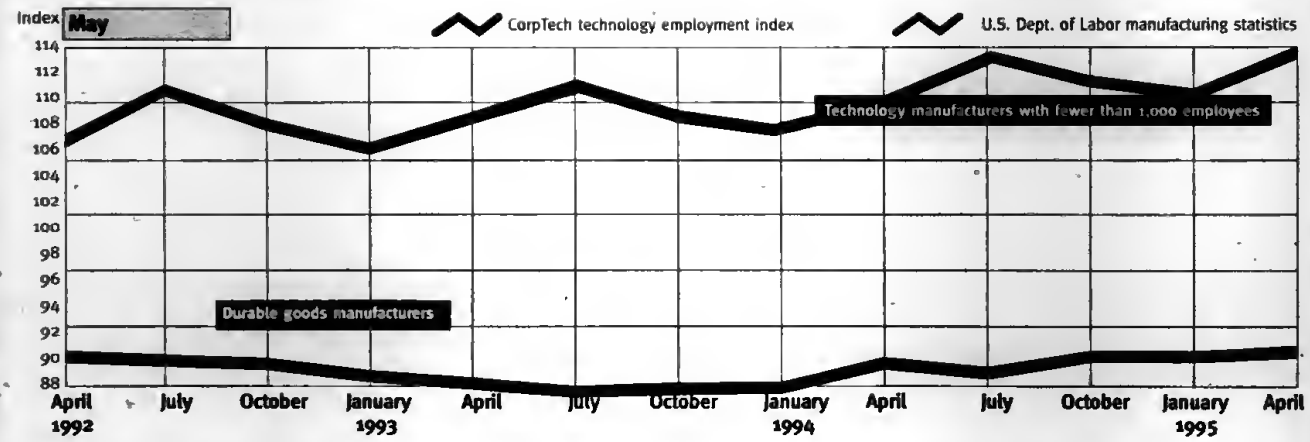
WASHINGTON, D.C.
Katie Kress
8304 Professional Hill Drive,
Fairfax, VA 22031, 703-573-4115

CHICAGO
Patricia Powers
1011 E Touhy, Suite 550,
Des Plaines, IL 60018, 708-827-4433

LOS ANGELES
Barbara Murphy
2171 Campus Drive, Suite 100,
Irvine, CA, 92715, 714-250-0164

COMPUTERWORLD

Computerworld/CorpTech Career Index



© Copyright 1995, Corporate Technology Information Services, Inc., Woburn, Mass.

by invitation only....

To: Highly motivated and career oriented programmers and programmer/analysts with at least 2 years of experience in one or more of the following.

In Phoenix..
- IMS DB/DC - IEF
- AML ARCINFO • SAS
- CICS DB2 • SYBASE C/C++
- DALFALLER
- ORACLE 7.0/SQR
- POWERBUILDER

In Denver..
- DB2 DBA Data modeler
- 4th Dimension
- COBOL CICS, DB2
- INFORMIX 4GL C++ DO
- UNIX C/C++ GNU
- IMS DB/DC • FOXPRO

What: It's a variety of technically challenging assignments

Where: In Phoenix and Denver

When: Immediate positions!

Who: Professional Software Consultants Inc. Member of NACCB

Why: We offer excellent salary and benefits. And, we're just fun to be with.

RSVP: As soon as possible to Laurie Zinke, 4747 N. 7th St. Ste. 424 Phoenix, Arizona 85014 Call (602) 279 4008 or 1-800 279 8498 FAX (602) 279 1167

PSC

DATA PROCESSING PROFESSIONALS

COMPUTERMART OF GEORGIA, INC. headquartered in Atlanta, is a leader in Quality Contract Programming and Consulting. Our growth has created opportunity in the Atlanta area and other locations for versatile Professionals with state-of-the art skills in Programming, and Systems Design on all platforms.

Of special interest are the following skills: ACMS/Decforms, APS AS/400, RPG or COBOL, ASSET C++, CICS and DB/2, Datacom DBA Filenet, Informix, JD Edwards, Lotus Notes, Mastercarpe, Microfocus, COBOL, MUMPS, Oracle, Peopletoft, PowerBuilder, Progress, Sterling S/W, Teleer Act HR and Visual Basic

We offer competitive salaries, good benefits including 401K, and a management team that puts people first.

For immediate consideration, send resume to: 7274 Mt. Zion Blvd Jonesboro, GA 30236-2520 Local 478-5681 Fax (404) 473-1726

BECKY FINLEY
1-800-887-5105
COG| EOE

SENIOR SOFTWARE ENGINEER. Design, implement and test software tools for multimedia applications using C/C++ under multiple platforms (PC, Sun, Macintosh and Philips CD-I). Evaluate interface between hardware and software. Design and develop MS Windows GUI (graphical user interface) and DLL (dynamic link libraries) programs using C/C++. Develop and implement efficient computer algorithms for video compression. Must have an MS degree in Electrical Engineering or Comp. Sci. and one year exp. in the job offered or one year as a Research Assistant. The required one year experience must include C/C++ programming for multimedia applications on PC and Macintosh, and developments of MS Windows GUI and DLL programs. Must also have at least one publication or 3 months experience on the development of video compression algorithms. $45,000/yr. 40 hrs./wk. Must have proof of legal authorities to work permanently in the U.S. Send 2 copies of Resume, Diploma, Experience Letters and Publication to: Illinois Dept. of Employment Security, 401 S. State St., 3 South, Chicago, IL 60605. ATTN: Leila Jackson Ref. #V-IL-12944-J. No Calls. An Employer Paid Ad.

PRODATA INC. Portland, OR · Salt Lake City, UT · Sacramento, CA

As One of the West's premier IS Consulting Service firms, We Offer:

- *Career Growth • Excellent Compensation • Loaded Perks*
- *Continuing Education • The Challenge of Diversity*
- *Fortune 500 Clientele • Outstanding "Quality of Life"*
- *A Decade of Sustained Growth • Relocation Assistance*
- *training • international travel opportunities*

We Need:

MICROSOFT: Visualbasic, Visual C++, SQL/Server, Access, Windows NT, NT Server
ORACLE: Forms, PL/SQL, V7, Report, CASE, DBA's
OOP/GUI: Powerbuilder, Delphi, Progress, C++, Gupta/SQL
3GXL: DB2, CICS, IMS, COBOL, IDMS/ADSO, HURON
CASE: T.I. IEF/5.3, C
GROUPWARE: Lotus Notes

PRODATA	PRODATA	PRO-STAR
4800 S.W. Macadam Suite 309 Portland, OR 97201 (PH) 503 223-3508 FAX 503 223 7916	1100 E. 6600 S. Suite 200 Salt Lake City, UT 84121 (PH) 801 266-6138 FAX 801 266-6069	6929 Sunrise Blvd. Suite 210 Citrus Hts., CA 95610 (PH) 916-920 8763 FAX 916 722 1045

Attention Contractors!

Add your resume to the Jupiter database and let all the consulting companies that are looking for your skillset come to you. Assignments/Positions are available nationwide for absolutely all skillsets. The Jupiter System, an on line database of IS professionals that are available for contract and/or permanent positions, can give you the added advantage in finding that perfect assignment or job. **And it costs you nothing!** If you want that added advantage, mail or fax your resume to:

The Jupiter System
P.O. Box 37075
Kansas City, Missouri 64138
816-763-5258 · Fax: (800) 505-6293

Assignments: Contract W2 • Contract 1099 • Contract for Hire • Permanent Placement
Positions: Applications Programmers • Database Administrators • Lan Administrators • Programmer/Analysts • Systems Analysts • Systems Programmers • Team/Project Leaders • Technical Writers

---

UNIX/C/C++ PROFESSIONAL

Youngtech, the Object-Oriented Technology Co. has immediate openings on the advanced software R/D organization seeking professionals and top college graduates who have a Ph.D. or Masters degree in CS, CE with strong background in UNIX/C/C++ and experience in one or more of the following would be a plus: OOA, OOD, X-Window, MS-Windows, GUI, Sybase, Oracle, Informix, Internet, X.25, Frame Relay, TCP/IP and Networking.

We offer excellent salary, benefits and career opportunities. For confidential consideration, please submit your resume or contact our Recruiting Director.

YOUNGTECH, INC.
THE OBJECT-ORIENTED TECHNOLOGY CO
379 Thornall St., 5th Floor, Edison, NJ 08837
1-800-388-8018, Fax 908-548-8668
E-mail: tom@youngtech.com

Senior Systems Programmer
$18.16-$22.56 hourly

State of Utah, SLC. Install, customize and provide system administration functions for CICS in an MVS/ESA mainframe environment. Experience with mainframe CICS applications is required. Specific experience with CICS installation using SMP/E is highly desirable. Must be familiar with MVS/ESA, TSO/ISPF, JCL and IBM utilities. Requires a bachelor's degree in computer science plus five years of work experience. Can substitute work experience for degree.

Contact Kern Adams at **801-538-3220** for more information.
Recruitment closes on 6-28-95

CONSULTANTS SHOULD CONSULT

MIMI

IMMEDIATE CONTRACTS
Please send resume & call
Mimi Simon Assoc
50 West St. Suite 1705, NYC 10006
(212) 406-1705
FAX (212) 406-1768

CONSULTANTS

- All Technologies
- Nationwide Openings
- Salaried or Project Basis
- 2+ Years Experience

Send/Fax resume to:
Analysts International Corp.
P.O. Box 39612
Minneapolis, MN 55439
Fax (612) 897-4693

Attention Computer Consultant Business Owners and Managers:

Join your colleagues at the National Association of Computer Consultant Businesses' Eighth Annual Conference. Learn from leading edge sessions, new speakers and industry trainers. Network with your peers, share ideas and experiences that can have an immediate impact on your business and enhance your ability as an industry owner or manager. Renew friendships from previous years' conferences and find renewed energy in the association. It's going to be the biggest and the best ever so don't miss out! Call (800) 313-1920 NOW for more information!

October 18-22, 1995
Westin Mission Hills Resort
Rancho Mirage, California

CONTINUOUS IMPROVEMENT · EIGHTH ANNUAL CONFERENCE · 1995 NACCB · EIGHTH ANNUAL CONFERENCE · CONTINUOUS IMPROVEMENT

IIC is a well established, ISO 9000 registered software consulting firm with a focus on client server and other leading edge technologies. We have operations in NY, NJ, CT, FL, NC, AZ and CA. We are looking for experienced consultants in the following fields:

UNIX/OS/2/MVS/WINDOWS
C++/SMALLTALK/RDA/OOD
POWERBUILDER/GUPTA/VISUAL BASIC
SYBASE/ORACLE
DB2/CICS/CSP/LU6.2/CPI
DEVICE DRIVERS
TELEPHONY/CALL PROCESSING/DNIS/100
GNU/NETWORK ADMINISTRATORS
DATABASE ADMINISTRATORS
LOTUS NOTES ADMINISTRATORS

IIC, 331 Main Mall, Suite 108, Poughkeepsie, NY 12601
Phone: 1-800-800-IIIC Fax: 914-473-1197
Email: recruit@iicmps.iic.com

Assistant Director of Technical Services
University of Nebraska Medical Center, Omaha, Nebraska

As Omaha's 3rd largest employer, The University of Nebraska Medical Center (UNMC) is offering a challenging opportunity for an individual to lead its technical services division in the Information Technology Services Unit. UNMC has identified information technology as a strategic priority, an integral component in meeting its mission to improve the health of Nebraska through premier educational programs, innovative research, the highest quality patient care, and outreach to the underserved populations.

Individual will join UNMC's Information Technology Services Unit with primary responsibilities to provide overall information systems technical support and direction for UNMC's complex IS environment with multi vendor hardware and software environments. Responsibilities include developing & supporting operating and network systems, systems software, IS configuration management, database administration, network design & support, capacity planning, R&D, contract negotiations, and managing staff and budget.

Qualified applicants will have a bachelor's degree in computer science or related fields, or equivalent experience. (Masters Degree Preferred) PLUS 7 years IS experience with 4 in systems programming and 3 in various positions of management with demonstrable achievements in technical leadership, systems software development, multi-vendor interconnectivity, and real time programming. Must have current knowledge of multiple vendor systems software and hardware architecture (e.g. Guardian, VM, VSE/ESA, VMS, UNIX, Windows/NT), WAN/LAN, client server architecture, working knowledge of OLTP systems. Knowledge of current health care information systems issues a benefit.

UNMC offers a comprehensive benefits package. Salary negotiable. Send letter and resume to: UNMC Employment Office, University of Nebraska Medical Center, 600 South 42nd Street, Omaha, NE 68198-5470, or email KSTROMBE@UNMC.EDU

AA/EOE. Women, Minorities, and the Disabled are encouraged to apply.

Disney

DATA COMMUNICATIONS ANALYST

Disney Worldwide Services has an immediate opening for a Data Communications Analyst within the Information Processing and Network Services Division located in Lake Buena Vista, Florida.

Qualified candidates should possess a Bachelor's Degree in Computer Science or related field, or equivalent experience. Candidates must have a minimum of 3 years experience installing and maintaining multi-post office cc:Mail configurations as well as experience installing and trouble shooting dial-in access to cc:Mail or other LAN-based systems, designing, installing and maintaining Novell 3.x and 4.x systems and the ability to diagnose and repair complex E-mail problems. The knowledge of electronic messaging standards, industry directions and key product and service providers, enterprise-wide directories, workgroup and other electronic messaging related desktop products for Windows, Macintosh, and UNIX and of wide area data communications technologies and protocols is essential. Strong project management skills are also required.

For consideration, please forward your resume and cover letter, complete with salary history, to the address listed below. Resumes must be formatted chronologically on white or light colored 8½" x 11" paper in order to be entered into our resume tracking system.

Walt Disney World Co.
Salaried Casting
Dept JSCW50605
P.O. Box 10,090
Lake Buena Vista, FL 32830

© The Walt Disney Co.

Disney Worldwide Services, Inc.

We are an equal opportunity employer / a smoke free workplace

"From some 600 responses generated by a recent Computerworld recruitment advertisement, we've already hired about 50 professionals who were direct replies -- and we're still hiring from that advertisement."

Jason K. Whitehair
Recruiting Manager/Systems Engineering
MCI Telecommunications Corporation

Having just celebrated its 25th anniversary and exceeding $10.6 billion in revenue, MCI is not only the nation's second largest long-distance provider, but also the world's fifth largest carrier of international traffic. Because the Systems Engineering Division plays a strategic role in shaping MCI's technological future, Recruiting Manager Jason Whitehair relies heavily on *Computerworld* to help recruit leading-edge professionals.

"Dedicated to delivering premier customer service and the highest quality products, Systems Engineering provides systems and software development and support to all of MCI's domestic and international voice and data businesses. Everything from message processing and commercial billing ... to network management and control ... to MCI Mail ... and more. Take our Friends & Family program, for example. Our software applications are what keep track of millions of 'calling circles' and generate customized bills.

"Not limited to any one platform, we utilize the platform best suited to deliver each customer service. So I'm always looking to recruit systems engineers with at least five to seven years of experience in a wide range of technical environments. Because *Computerworld* is one of the best trade publications for staying on technology's leading edge, its readers are the professionals we're generally looking to recruit. When it comes to recruitment advertising, *Computerworld* delivers a much higher ratio of qualified candidates than daily newspapers or nontechnical publications.

"The vast majority of resumes generated by our *Computerworld* recruitment advertisements are from very high calibre candidates. We're typically able to use 350 out of every 400 resumes we receive -- and that's a hit rate of nearly 90%. In fact, from some 600 responses generated by a recent *Computerworld* recruitment advertisement, we've already hired about 50 professionals who were direct replies -- and we're still hiring from that advertisement. For a single advertising investment, we've more than gotten our money's worth.

"After Systems Engineering moved from Washington, D.C. to Colorado Springs back in 1991, our *Computerworld* recruitment advertising has been instrumental in helping us hire more engineers than usual -- and hire them fast. And, since I'm still seeing activity as a result of a recruitment advertisement we ran five months ago, I know we get sustainable impact with *Computerworld*.

"As MCI continues to expand into the long distance market including data transmission, 800 service, international calling, and Personal Communications Services (PCS), we'll continue to rely on *Computerworld* recruitment advertising to attract the hard-to-find, highly qualified technical people our global business demands."

Computerworld. We're helping Information Systems employers and qualified Information Systems professionals get together every week. Just ask MCI's Jason Whitehair.

To put Computerworld to work for your hiring effort, call John Carrigan, Vice President, at 1-800-343-6474. And place your hiring message where the qualified candidates look. Every week.

1 800 343-6474
in MA 508 879-0700

COMPUTERWORLD

Where the qualified candidates look. Every week.

Your career is knowledge.

http://careers.computerworld.com

POWER

YOUR POWER IS YOUR CAREER.

Your knowledge is power.

http://careers.computerworld.com

Your power is your career.

YOUR CAREER IS KNOWLEDGE.

POWER

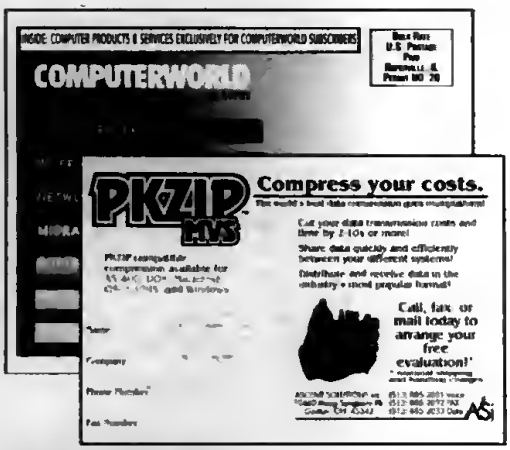
Your knowledge is power.

"By consistently generating some of our highest quality leads and keeping our pipeline of product evaluators full, *Computerworld Direct Response Cards* are instrumental in helping our product sell itself."

Scott C. Avera
Vice President/General Manager
ASCENT SOLUTIONS, INC.

Manager Scott Avera of Ascent Solutions, Inc. (ASi), is always looking to build product awareness and enhance support to some 33 international resellers. For that reason, he advertises in *Computerworld Direct Response Card Decks.*

According to Avera, "Once users experience the cost, space, and time savings of our compatible data compression software firsthand, our products literally sell themselves. But first we have to generate product evaluations among buyers in the Fortune 500 and 1000, as well as in government and education. Gaining widespread exposure for our multi-platform PKZIP product line is where *Computerworld Direct Response Cards* have helped our marketing efforts tremendously."



About ASI:

ASI of Dayton, Ohio provides a complete line of data compression software with full cross-platform compatability on PCs and mainframes worldwide.

The Right Audience Means High Quality Leads

Says Avera, "*Computerworld Direct Response Cards* reach ASi's audience... high-end corporate IS professionals who are responsible for implementing company-wide integrated solutions. At ASi, our goal is to have between 50 and 100 potential buyers evaluating our products at any given time. Leads from the *Computerworld Response Card Deck* keeps our pipeline of potential buyers full."

Get Immediate Results With The Computerworld Card Deck

In terms of advertising effectiveness, Avera says, "I've been truly amazed at our response rate. Being a small and relatively young company we need fast punches that are immediately profitable. That's exactly what *Computerworld Response Cards* deliver." "Making a powerful impact — immediately and cost effectively — is what successful marketing is all about. For ASi, that means generating high-quality leads with an ongoing presence in *Computerworld Direct Response Cards.*"

***Computerworld Direct Response Cards* give you a cost–effective way to reach Computerworld's powerful buying audience of over 142,000 computer professionals. Every month. They're working for ASi – and they can work for you.**

To reserve your space, call Norma Tamburrino, National Account Manager, at 800–252–4821, ext. 409 – today!

COMPUTERWORLD
Response Cards

Turn this Page and Find the Key to Buying Smart

In Computerworld Marketplace -- Where IS Buyers Find Solutions

Find the picture of this key in one of the ads in the following Marketplace section, and we'll send you a FREE T-shirt, sweat shirt, duffle bag, tote bag or sip-it-bottle -- your choice!

Fill out the form below telling us which Marketplace advertisement contains the hidden key and fax back to us -- we'll send your selected free item right away.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip Code _____

Telephone _____ Fax _____

The hidden key is on _____ in _____ advertisement.
(page number) (advertising company name)

Please send me : (check one only)

_____ Sweat shirt (one size fits all)
_____ T-shirt (one size fits all)
_____ Duffle Bag
_____ Tote Bag
_____ Sip-it-Bottle

FAX or Mail to: Nancy Whittaker/Computerworld Marketplace
375 Cochituate Road
Framingham, MA 01701
FAX: (508) 820-0941

COMPUTERWORLD
Marketplace

Offer expires 6/30/95

Look for it!

BIGGER, not always better

Integrated software packages strive to offer a balance between features and functionality

By Lynn Haber

Bigger is not necessarily better, especially when it comes to software suites. They cost more, eat up storage, require more training and are generally underused — at least that's the rationale behind the product category known as integrated software.

Commonly referred to as the "Works" category, integrated software includes programs such as Claris Corp.'s ClarisWorks 3.0, Microsoft Corp.'s Works for Windows and Novell, Inc.'s PerfectWorks 2.1.

Unlike suites that include stand-alone applications such as Microsoft's Office, integrated software consists of modules that do not operate independently. "Our goal is to achieve a balance of functionality and utility," says Sam Ye, product marketing manager at Novell.

Product bundling has made integrated software prevalent in the consumer market, but it has also achieved acceptance in the small business arena. Moreover, revenue climbed 6.6% between 1993 and 1994, says Nicole Roth, senior analyst at International Data Corp. in Framingham, Mass.

Because the products are easy to use and require little training, they are geared toward first-time and occasional users. "We try to focus on the right set of features for our target market — features the user will likely utilize all of the time vs. only some of the time," says Edith Gong, product marketing manager at Claris.

ClarisWorks 3.0, for example, includes a word processor, spreadsheet with charting, database, graphics and painting as well as presentation capabilities. While medium-size to large companies are not the target market for the company's product, Gong says corporate interest has increased.

The interest may be because of the size and systems requirements of Works packages, according to analysts. For example, full installation of Works for Windows requires a 14M-byte hard drive and 4M bytes of RAM. Compare that with the company's Office product (the Professional version) that requires a 58M-byte hard drive and 8M bytes of RAM. Maximum installation, including all files, is 82M bytes.

Traditional arguments against using Works products have been their lack of features, but the fact that recent versions of suite products are bloated and growing bigger has not gone unnoticed.

Another concern is the integration with office suite applications. Like other vendors of Works products, Claris tries to provide the latest translators for the leading office automation products.

"Integration between the Works and suite products is getting better, but it isn't always easy," according to Brian Fukuda, an industry analyst at Dataquest, Inc. in San Jose, Calif.

In addition, Novell is reportedly going the extra mile to achieve integration between PerfectWorks and stand-alone office automation applications, offering the capability to use and read other file formats, according to Roth.

PerfectWorks 2.1 for Windows is scheduled to ship this month and is being positioned as a bridge that will enable users to upgrade to stand-alone or suite products, Ye says.

But the choice between a suite or a Works product must be based on user needs and the desired level of product sophistication.

However, the reality of today's market is such that most medium-size to large companies choose to standardize on best-of-breed office automation applications. "For most companies, Works products are not suitable because they lack the functionality that is required on a day-to-day basis," Roth says. •

Haber is a freelance writer in Boston.

SHOPPING FOR "WORKS" PACKAGES

While industry watchers say they expect the integrated software market to flourish, it's being squeezed at the high end by price reductions in the suite product category. Moreover, the low end must contend with new entrants such as Microsoft's Bob.

For now, vendor choice is limited, and the following three packages are garnering the most attention. They cost less than $100, so there's little room for price reductions, and opportunity for product differentiation is minimal, analysts say.

▪ **ClarisWorks for Windows.** Modules: Word processing, spreadsheet, database, presentation, draw/paint. Price: $99. Minimum systems requirements: 386DX/25MHz-based PC or higher; 4M bytes of RAM; 10M-byte hard disk for full installation. Claris Corp., Santa Clara, Calif. (408) 727-8227.

• **Works for Windows.** Modules: Word processing, spreadsheet, database, charting, drawing. Price: $99.95. Minimum systems requirements: 386SX-based PC or higher, 4M bytes of RAM, 14M-byte hard disk for full installation. Microsoft Corp., Redmond, Wash. (800) 426-9400.

▪ **PerfectWorks 2.1.** Modules: Word processing, spreadsheet, database, paint, draw, communications. Price: $99. Minimum systems requirements: 386-based PC, 4M bytes of RAM and 13.5M-byte hard disk for full installation. Novell, Inc., Orem, Utah (800) 451-5151.

COMINGS AND GOINGS

• **Corel Corp.** is expected to introduce a 32-bit version of its recently available Corel CD Office Companion in the third quarter of this year. It will reportedly include an integrated word processor, spreadsheet and database. Ottawa (613) 728-8200.

• **SoftKey International, Inc.** has discontinued development of its WindowsWorks product, although it may still be available on retailers' shelves. Cambridge, Mass. (617) 494-1200.

ADVERTISERS LISTINGS

MARKETPLACE

INDEX

Automatic NLM Scheduler
Knozall (800) 333-8698 pg 121
Buy/Sell/Lease
Carlson Computer Intl (800) 334-7073 pg 122
Computer Presentation
Boxlight (800) 762-5757 pg 123
Panelight (800) 726-3599 pg 122
Connectivity Software
Beame & Whiteside (800) 810-7896 pg 121
Data Center Design & Construction
Bruns-Pak (908) 756-1222 pg 124
Desktop MICR Solutions
CheckMaster (800) 334-8449 pg 121
Enterprise Software
Allen Systems Group (800) 932-5536X411 pg 122
Large Systems Computer & Peripherals
Spectra Equipment (800) 745-1233 pg 123
Outsourcing
American Software (404) 264-5770 pg 124
Outsourcing/Remote Computing
Alicomp (800) 274-5556 pg 123
Faneuil Systems (708) 574-3636 pg 123
Remote Access Control
Lodestar Technologies (800) 776-4346 pg 122
Security
Secure It (800) 451-7592 pg 121
Systems & Services
Dempsey Business Systems (800) 888-2000 pg 122
Training for Corporate End-Users
Keystone Learning Systems (800) 748-4838 pg 121

CLASSIFIED SOLUTIONS DIRECTORY

Bids / Proposals
Business Consulting
Consulting
Contract Programming
Conversions
Data Warehousing
Education & Training
Elect Data Interchange
Electronic Documentation
Fax-On-Demand
I/T Consulting
Outsourcing
Outsourcing/Remote Computing
PC Solutions
Software Reuse
Workflow Application Software

TRADESHOWS & EXHIBITIONS

Mobile World*
Dallas
June 6 - 8, 1995;
Int'l DB2 Users Group*
Orlando
June 11 - 15;
Database & Client Server World*
Boston
June 13 - 15;
PC Expo*
New York
June 20 - 22;

*Indicates Bonus Distribution

Premier

Video Training for the Entire Enterprise

Dawn Bjork — Microsoft Certified Trainer & MS Word Instructor
Rob Aronson — NetWare 4.1 Instructor & Novell CNI & ECNE
Alison Belter — Microsoft Certified Trainer & MS Access 2.0 Instructor
Chris Maio — Lotus Notes Certified Trainer & Notes 3.x Instructor

Word 6.0
Reg/Int/Adv (ea) $40.95
Special All Three $129.95

Access 2.0
Reg/Int/Adv (ea) $49.95
Special All Three $129.95

Windows 3.1
Reg/Int/Adv (ea) $40.95
Special-All Three $129.95

Excel 5.0
Reg/Int/Adv (ea) $49.95
Special-All Three $129.95

Project 4.0
Level I/II/III/IV (ea) $79.95
Special-All Four $299.95

Other Videos
PerfectOffice Call
SmartSuite Call
Visual Basic Call

KeyStone Learning Systems Corp.
Average: 2 hours per video

NetWare 4.1
Level 1/2/3/4 (ea) $80.95
Special-All Four $329.95

Lotus Notes 3.x
App. Dev. Lev 1 $80.95
App. Dev. Lev 2 $80.95
Sys. Adm. Lev 1/2 (ea) $80.95
User $49.95
Special-All Five $379.95

Windows NT 3.5
Installation $80.95
NT Server Level 1 $80.95
NT Server Level 2 $80.95
NT Workstation $80.95
Special-All Four $299.95

SQL Server 4.x
SQL Server Level 1 $80.95
SQL Server Level 2 $80.95
SQL Server Level 3 $80.95
VB/SQL Connection $80.95
Special-All Four $329.95

PowerBuilder 4.0
Level 1/2/3 (ea) $80.95
Special-All Three $249.95

Special Microsoft Office With Combinations
Microsoft Office 4.x Standard ____ $340.95
• 3 Word 6.0, 3 Excel 5.0, 3 PowerPoint 4.0
• 9 videos with over 27 hours of training
Microsoft Office 4.x Pro ____ $405.95
• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0
• 3 PowerPoint 4.0, 1 MS Mail training videos
• 13 videos with over 24 hours of training
Microsoft Office 4.x Plus ____ $670.95
• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0
• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail
• 18 videos with over 29 hours of training

3 Easy Ways to Order:
CALL 1-800-748-4838
801-375-8680
FAX 1-801-373-6872
MAIL KeyStone Learning Systems Corp. 2181 Lawson Parkway Provo, UT 84606
AM 0206

Kablit™ Security

NOW!

STOP COMPUTER THEFT
IN THE OFFICE — ON THE ROAD

- Secure computer or notebook to desk, table, etc.
- Protect data
- Lifetime warranty

Kablit™ II — Fixed Location — List $34.95
Kablit™ T-Lock — Any Location — List $39.95
Disk Drive Lock — Data Security — List $24.95

Padlock Security Provided by Master Lock

Quick And Easy To Install!
Compact — Lightweight!
Available For Macintosh Computers Too!

Order Now — Call 800-451-7592

Secure-It
10 Maple Court, East Longmeadow, MA 01028, USA 413-525-7039
The particular Master® Lock trademarks used are trademarks of the Master® Lock Company and are used by Secure-It, Inc. under license.

BW-Connect NFS for DOS & Windows

Get a FREE upgrade to Windows 95 version*, plus WWW & Gopher servers.

✓Full E-mail support for MIME attachments and the MAPI interface.
✓Fully supports DHCP client and BOOTP client and server for easy, centralized TCP/IP administration.
✓$349 per user! (Substantial quantity discounts available).
✓Factory Direct!
✓FREE evaluation! Call today!

1-800-810-7896

Factory Direct!
Beame & Whiteside Software™
Let's Connect!™

*Provided user is under Beame & Whiteside Technical Support ("Support Services") contract at the time of the release.
Trademarks are the property of their respective owners. Tel: (919) 831-8989. Fax: (919) 831-8990. ©1995 Beame & Whiteside Software, Inc. 1156/10

DO YOU NEED TO UNLOAD YOUR DATA BASE BEFORE BACKUP?

NLMAuto™ Automatically Loads & Unloads NLM's.

What NLMAuto™ Will Do For You
- Eliminate the need to manually load and unload databases
- Improve cache performance.
- Increase network security
- Reduce after hours work

CALL TODAY TO ORDER.
UNCONDITIONAL MONEY BACK GUARANTEE!
1-800-333-8698
FAX (602) 545-0008
Knozoll Systems, 375 E. Elliot Rd. #10
Chandler, AZ 85225
A Division of Tangram Enterprise Solutions, Inc.

MICR ENCODING SOLUTIONS

SOFTWARE
You can have complete control over your MICR encoding requirements. CheckMaster has a wide range of solution software and can design packages for your specific needs.
- New account checks as starter kits
- Depository Transfer (DTC) checks
- Pre-authorized draft printing software
- Payable and payroll checks with vouchers
- Official checks and cashier's checks
- Benefit checks and coupons
- Emergency checks
- Internal - debit, credit and teller slips

MICR FONTS
CheckMaster provides MICR Fonts and toner to Chase Manhattan Bank, The Northern Trust and others. Our reliable proprietary fonts include:
E13B
CMC7
DCR-A
DCR-B

CUSTOM SOFTWARE
CheckMaster specializes in custom software for the corporate, banking and financial industry running Windows 3.1, Windows for Workgroups 3.11, Windows NT or Windows 95.
CheckMaster has completed custom work for banks, insurance companies, property management firms, industrial check printers, payroll companies and Fortune 500 companies. Our customers include Chase Manhattan Bank, GE, and many others. Call us now for your custom application needs.

CheckMaster can provide MICR toner for the HP LaserJet III, IIIsi, 4, 4m and other HP laser printers. Toner is also available for other printers. Call for further information.
CheckMaster™ is a trademark of CheckMaster Corporation

CheckMaster Corporation
1102 South Pacific Street
Oceanside, CA 92054-4912
619.757.6638 800.334.8449

- - - - On The Info Hwy. With Carl & Fred by Blick - - - -

How many products does it take to manage customer service in your data center?

ENTERPRISE MANAGEMENT

More than one?

What would your customers say if you installed one software product that could:

Present your service solution across any platforms you choose;

Automate your system facilities to communicate with your enterprise management solution;

Integrate your service desk, problem, change, and asset management disciplines; and--

Distribute your data and applications across popular non-proprietary, relational databases?

How about, *"Thank you."*

ASG announces **ASG-IMPACT™** and **ASG-IMPACT/LAN.™** today's only totally integrated customer service, enterprise management solution.

Call your ASG sales and service representative today for details.

1-800-932-5536. Ext. 411.

ALLEN SYSTEMS GROUP
Customer Service for the Enterprise

Offices: Naples, FL Atlanta Boston Sydney Paris Tokyo Amsterdam Singapore Bristol U.K.
Copyright 1995 Allen Systems Group, Inc. All products named herein are trademarks of their respective holders.

Power Tools for the Power Presenter

One stop shop for all major brands

COLOR from $1,795

For the latest in color projection panels and projectors call the experts in LCD technology. Your satisfaction guaranteed or your money back. Quick delivery via Fed-X or UPS.

Call for CATALOG 1 800 726 3599

nelight
PLAYSYSTEMS, INC.

101 The Embarcadero Ste. 100-A, San Francisco, CA 94105
Hours: 6:30 to 5:30 PST, 9:30 to 8:30 EST
VOICE: 415 772 5800 FAX: 415 986 3817

WHEN A WARM BOOT DOESN'T WORK... THERE'S ALWAYS THE IPS-110

- Remote power cycle 1 to 1,024 devices from single line
- User ID/Password Security, with device database
- User programmable power sequencing
- Dial-Back: individual power loss, temp, UPS on battery
- VT100 Emulation/2400 Baud built in modem
- Internal battery backup
- Current verification on each device
- 30 Day Money Back Guarantee, One Year Warranty

FOR A PERSONALLY GUIDED DEMO CALL:
1-800-776-4346

LodeStar Technologies Inc.

Dempsey: Your Source For IBM® Equipment

Buy Sell Lease Rent

- RS/6000
- AS/400
- Industrial PC
- Processor
- Peripherals

(800) 888-2000

CARLSON COMPUTER INTERNATIONAL

• BUY • • SELL •
• LEASE • • TRADE •
•• RENT ••

• SYSTEMS • WORKSTATIONS
• UPGRADES • MEMORY
• DISKS • PERIPHERALS

DEC & SILICON GRAPHICS

NEW . . Discounted from list price
USED . . . At a fraction of list price

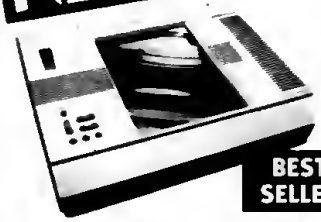
"We love spending money buying computer gear"

800-334-7073

CARLSON COMPUTER INTERNATIONAL
11956 BERNARDO PLAZA DR. #503
SAN DIEGO, CA 92128
(619) 675-3377
FAX (619) 675-3379

Three for the show.

NEW!



BEST SELLER

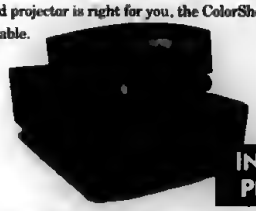
Affordable color! Our most popular product just got even better. Better wall-sized true-color projection at the same unbeatable price. The BOXLIGHT ColorShow 1200 is our best seller for a good reason - value!

BOXLIGHT 1200. $2,299

- 24,389 vibrant colors
- Universal PC and Mac compatibility
- Compact, portable design
- FREE remote control and cables
- Brightest color at any price
- Now with faster mouse response!

COLORSHOW 2000. $3,999

The ONLY "all-in-one" LCD data projector priced under $4,000 is now available exclusively from BOXLIGHT! The sleek, compact design offers unobtrusive operation in the boardroom and folds for ultimate portability. The bright STN technology delivers rich brilliant color from your PC or Mac. If the convenience and performance of an integrated projector is right for you, the ColorShow 2000 is unbeatable.



INTRO PRICE

- Sleek, compact and stylish design
- Compatible with PC or Mac
- Less than 20 lbs. travel weight
- Includes free remote control
- Optional Computer Control Wand

An Inc. 500® Company

SPECIAL OFFER

Active-matrix Color at a passive matrix price! TFT 24-bit processing for photo-realistic color in an under $3,000 panel! Fast-changing meetings require the speed of active-matrix technology. BOXLIGHT's best-selling ProColor is the choice of hundreds of our Fortune 1000, Government and Higher Education customers, like YOU!

PROCOLOR 1300. $2,999

- 16.8 million color palette
- Lightweight, reliable and rugged design
- PC/Mac compatible upgradeable to video
- Multimedia model 1500 only $3,799!

BOXLIGHT: Your direct source for all the bright answers.

- More than 50 models in stock
- Instant availability
- Overnight shipping
- 30-day guarantee and extended warranties
- Expert technical support

ANNIVERSARY

No one else offers the one-stop shopping...the selection... the value...the immediate delivery... and the knowledgeable service and support you get from the projection panel experts.

The Inc. 500 logo is a registered trademark of Goldhirsh Group, Inc.

BOXLIGHT™ CORPORATION

IBM

- ES/9000
- AS/400
- RS/6000
- SYSTEM/88
- SERIES/1
- Point Of Sale

...and more!

New & Used

- *Computers*
- *Peripherals*
- *Upgrades*

Buy • Sell • Rent • Lease

amdahl
Cisco
Concurrent
Data General
digital
Hitachi
HEWLETT PACKARD
Memorex-Telex
Prime
Silicon Graphics
Stratus
Sun
TANDEM
TEXAS INSTRUMENTS
UNISYS
XEROX

SPECTRA
(800) 745-1233
(714) 970-7000 • (714) 970-7095 Fax

Anaheim Corporate Center
5101 E. La Palma Ave., Second Floor
Anaheim, CA 92807

ALICOMP, INC.

The "Boutique" of the Computer Services World

Outsourcing Remote Computing

VM, MVS, VSE

Two State of the Art Locations:

ALICOMP / CBS

20,000 sq. ft. Manhattan complex 105,000 sq. ft. Secaucus, NJ complex

"Our Platform is Excellence"

Serving Clients Since 1980

(212) 886-3600 • (800) 274-5556

Your best choice for mainframe computing service

REMOTE COMPUTING

Extensive Software Library

Telenet Tymnet
Advantis Compuserve

MVS/ESA IMS/DBDC
VM/ESA CICS SAS
VSE/ESA TSO DB2

Extraordinary Customer Service
Migration Management

708-574-3636
New England 617-585-9100
815 Commerce Drive, Oak Brook, IL 60521

FANEUIL SYSTEMS

WHEN A DATA COMMUNICATION CENTER IS YOUR FUTURE...

- Uninterruptible Power
- Fire Suppression
- Diesel Generators
- Access Control
- Data/Tele Communication Equipment Planning

- Redundant Cooling System
- Environmental Monitoring
- Consolidation, Relocation, Expanding Evaluation Services
- Design, Engineering and General Construction Solutions

BE SURE TO SELECT THE RIGHT TECHNOLOGY SPECIALIST

BRUNS-PAK, INC.
300 B CORPORATE COURT
SOUTH PLAINFIELD, NJ 07080
(908) 756-1222

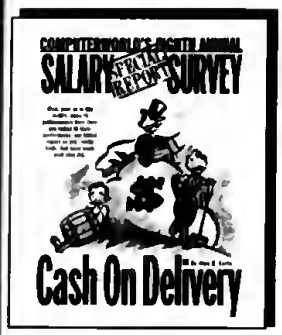
THE DATA CENTER SOLUTION

If Outsourcing is your objective...

You can maximize your information technology investment by outsourcing part – or all – of your IS operation. Whether it's a transitional or long-term total services partnership, American Software's the right place to rightsize.

Even software developers enjoy the cost and time-saving benefits of outsourcing with us. Call today and we'll tell you why.

The Outsourcing Group
A Unit of American Software USA
470 E. Paces Ferry Road
Atlanta, GA 30305
404-264-5770



Attention IS Professionals

Find out where the money is! ***Computerworld's 1994/1995 Salary Survey*** disk is just what you need to get an inside look at what professionals are getting paid.
Get the facts on:

- Salaries in 28 IS specific job titles
- Salaries in 21 industries
- Salaries by geographic regions - not published anywhere else

Call to order ***Computerworld's Salary Survey*** on disk today.

ONLY $99

Call toll-free 1-800-495-0157, ext.10

Please M
Seller of
Remote C

Hundred
Already
Compe

The Business Charter. Positioning itself as "Your Best Choice for Mainframe Computer Services," Faneuil Systems has been providing outsourcing and remote computing services to a growing base of customers throughout the U.S. for over a decade.

The Target Audience. "In a broad sense, our target audience includes anyone with a mainframe on the floor. More specifically, Faneuil Systems targets organizations looking to outsource their corporate data centers while transitioning to smaller platforms - and companies needing outside services to drive their mainframe-based applications.

The Advertising Vehicle. "Computerworld Marketplace puts us in touch with organizations that have specific mainframe criteria and are a good fit for our environment. It's also where we establish credibility over time by building name recognition and corporate visibility.

The Results...Bottom Line. "In our business, the quality of leads is what we focus on most. And we experience a higher rate of closure with leads generated by Computerworld Marketplace than with leads from any other source. Because we consistently get very qualified prospects, we advertise in Computerworld Marketplace exclusively. Until I'm convinced that we can get better results elsewhere, Faneuil Systems will continue running weekly advertisements in the primary classified resource for IS — Computerworld Marketplace."

COMPUTERWORLD
Marketplace
1-800-343-6474, ext. 744

Classified Solutions

MARKETPLACE

DISCOVER THE POWER OF FAX-ON-DEMAND
Improve customer support & distribution costs, increase sales & advertising results. Get Fax On Demand: The Marketing Tool of the 90's - industry's leading resource on computer fax applications. More by fax at 408-243-2275 doc 215
ABConsultants (800)-982-3715

MAINFRAME SOFTWARE SUPPORT SERVICES OPERATING SYSTEM MIGRATION, PERFORMANCE TUNING, DATABASE, PROGRAM PRODUCT SUPPORT, DATA MANAGEMENT, CICS, DB2, IMS, NCP, VTAM AND MANAGEMENT CONSULTING
CAMERON OF ATLANTA INC.
(800) 331-7835

The Data Warehouse Experts
Looking for a company with years of experience in true Data Warehouse implementation? Look no further! Let Solveris help unlock the power of your information system!
Solveris Inc.
(800)-999-4829

To place your advertisement in the Classified Solutions section CALL 1-800-343-6474 ext. 744

EDI software, consulting, & integration
Next EDition, Inc. 14+ yrs exp
(216) 498-0602

RPM ™ NEW
Reuse Process Manager ™
The One and Only Process Manager That Combines OT, C/S and Reuse
A windows-based process manager tool with a fully customizable reuse-based, Object-oriented OO methodology for defining and managing the development of C/S applications.
Developed by Dr. Carma McClure
Extended Intelligence, Inc. (312) 346-5245 x380

Will your warehouse misfire from bad data?
The **Integrity Data Re-engineering Tool** transforms legacy data, saddled by account and department orientations, into consolidated views of customers and the business. Request paper detailing 5 legacy data contaminants you will encounter & stories on firms solving their data migration problems.
Vality Technology, Inc. 617-338-0300

Micro Focus COBOL, Dialog System, Panels2 solutions. Next EDition, Inc
(216) 498-0602

PC programming, DOS/WINDOWS
$30/hr. Courseware App (612) 854-6909
Fax (612) 854-1868

Information Security Training & Publications
CSI Membership includes monthly newsletter, buyers guide, journal, training discounts, hotline, net working, more. Seminars, conferences, June Network Security Conference in New Orleans. For free sample newsletter and information:
Fax (415) 905-2218 CSI 600 Harrison St SF CA 94107 phone (415) 905-2626
e-mail: prapalus@mv.com

METROPOLITAN TRANSPORTATION AUTHORITY NOTICE is hereby given that the Metropolitan Transportation Authority (MTA) will receive proposals for the following software and services as indicated below. Proposals submitted shall include Vendor qualifications, technical and price proposals. Copies of the documents may be secured from Ms. Jean Benning, Procurement Services, Metropolitan Transportation Authority, 347 Madison Avenue/5th Fl., New York, NY 10017 or by calling (212) 878-7209

RFP# 6-01-950734-0
DATE 6/26/95
TIME 3:00 P.M.

FOR OFF-THE-SEHLF ADMINISTRATION AND AUDIT SOFTWARE TO SUPPORT IBM'S RACF SECURITY SOFTWARE

KRESIC & MAZZONE INTERNATIONAL
Twenty years experience in international and domestic technology transactions, advising on **hardware and software agreements, OEM, strategic alliances, join development projects and protection, use, licensing and transfer of intellectual property**
For more information call
(203) 431-6204 or fax (203) 431-1945.

FINANCIAL TECHNOLOGIES
COMPUTER SERVICES DIVISION
(703) 631-4401
OUTSOURCING - REMOTE PROCESSING
Multiple IBM ES9000 Mainframes
MVS/ESA VM/ESA
Current Software Releases
7 days/week, 24 hours/day
Quality Service - Competitive Pricing

Assistance in Standard Generalized Markup Language. Concept development, requirements, documentation analysis, document type definitions, training, technical architecture, conversion, document viewing. Automate document preparation, reuse content in new ways.
Wayuys, Inc. **800-622-5315**

D SQUARE SOFTWARE, INC
800 700-5252 Fax 908-767 0722

We offer software services using ES 9000, AS/400, RS 6000, SUN hardware installed in an ISO 9001 certified Indian facility.

Get up to 40% cost savings using off-shore software development and maintenance services. Our skill areas include –

- CICS, DB2, CSP, MIS, PL/1, Assembler, COBOL
- RPC/400, Sybase, C/400, COBOL/400
- UNIX, C, Eng, Visual Gen, [illegible]

THE "CONVERSION SPECIALISTS"
AUTOMATED CONVERSIONS
TAILORED TO YOUR NEEDS
DOS TO MVS
HONEYWELL TO IBM
WANG TO IBM
OTHER PLATFORM CONVERSIONS
CSP TO COBOL/CICS
SHADOW TO CICS
MACRO TO COMMAND
RPG TO COBOL
PL/1 TO COBOL
COBOL TO COBOLII
CENTURY/FIELD EXPANSION
OTHER LANGUAGE CONVERSIONS
BELCASTRO COMPUTER SERVICES, INC
(216) 652-1628
(800) 521-2861

Outsourcing Remote Computing
Enter Into an Exclusive PARTNERSHIP

- Become one of our SELECT clients/partners
- Receive customized, comprehensive, personalized service
- Take advantage of flexible pricing consistent with your strategic computer technology direction
- Benefit from Value Added opportunities
- We guarantee to maintain or exceed your present computer service levels

• Focus on Your Primary Business •
• Reduce and Control Your Expenses •

ALICOMP, INC/CBS
(800) 274-5556
(See our ad in the Marketplace)

BRIDGTON INC.
Providing Solutions Through Talent & Technology
OPERATING SYSTEMS: UNIX, MS WINDOWS, MS-DOS, IBM, VMS
DATABASE: SYBASE, ORACLE, IMS, DB2
LANGUAGES: C, C++, COBOL II, POWERBUILDER, VISUAL BASIC/VISUAL C++, REXX, DCL/DEVICE, FORTRAN, CLIPPER
NETWORK: IBM AS 400, IBM PC (NOVELL/LAN), IBM MAINFRAME, DATA GENERAL, HP 3000
CASE TOOLS: ADW I & 2.7, ADW CMS 1000, OBJECTVIEW, IEF
SERVICES: CONSULTING, TRAINING, OUTSOURCING
PRODUCTS NO SUPPORT: SAP-MFA, HUMAN RESOURCES
Interested Contact: Vipul [illegible]

Increase Sales Save Advertising $$$

Are You in the COMPUTERWORLD Classified Solutions Section Yet?

If not, you're really missing out! Computerworld's Classified Solutions Section is your most cost-efficient means for placing your ad in the leading IS newsweekly -- reaching a powerful audience who personally spend an average of $4 million each year* on IT products and services. Here is what this special section within the Computerworld Marketplace has to offer:

$ Ad sizes available from 1/20th page to a full page - 15 sizes to choose from.

$ Black-and-white or color ads, use graphics or your logo.

$ New advertisers call to find out what this section within the Computerworld Marketplace has to offer you.

Get the most for your $$$.
Call Today to Place Your Ad in Computerworld's Classified Solutions Section
800/343-6474, ext. 744

*Computerworld Reader Profile, July 1994

COMPUTERWORLD Marketplace

PLACE

Microsoft Solution Providers are independent organizations that provide consulting, integration, development, training, technical support or other services with Microsoft products. Microsoft Solution Providers implement business solutions for companies of all sizes and industries by taking advantage of today's micro-computer technology for practical and client-server applications.
Call A Microsoft Solution Provider listed below, or for program information or a referral, call 1-800-SOLPROV.

Microsoft
SOLUTION PROVIDER DIRECTORY

Advanced Systems Training

Hilton Computer Strategies
6001 Savoy #207
Houston, TX 77036
Hilton Computer Strategies is the premier training facility in Houston for advanced systems training in Windows NT, Windows 95, Systems Management Server, and soon Information Exchange. Call 1-800-324-7415 for complete information

Advanced Training Consultant

Network Services Group, Inc.
8275 Allison Pointe Trail, Suite 375
Indianapolis, Indiana 46250-4207
Phone: (317) 579-5866 Fax: (317) 579-5807
E-Mail: 75361.3151@compuserve.com
NSG is Indy's NT networking leader. The "sales staff" is our team of Microsoft Certified Instructors/Engineers focused on enterprise solutions. Instructors are on-site consultants when not giving ATEC training.

Client Server

Advanced Information Solutions
730 North Franklin, Suite 710
Chicago, IL 60610
Phone: (312) 751-9700 Fax: (312) 751-9053
We are a full-service consulting company, specializing in designing, developing, and implementing Client/Server enterprise systems. Utilizing Visual Basic, Access, SQL Server, and the Microsoft suite of products, we are Chicagoland's premier provider of custom business solutions.

"COROMANDEL INDUSTRIES, INC.
70-15 Austin Street, Third Floor
Forest Hills, NY 11375
Phone: 800-935-3267 Fax: 718-793-9710
Leading developer of Client/Server products like Integra VDB Services include design and custom development of cross-platform, graphical applications using C++, Visual Basic, Microsoft Office, BackOffice, NT, OLE and SQL databases

Hummingbird Communications, Ltd.
2900 John Street
Markham, Ontario, Canada L3R 5G3
Phone: (905) 470-1203 Fax: (905) 470-1207
Hummingbird offers the most comprehensive, robust PC X connectivity product line available today. The eXceed product family is comprised of PC X software for Windows, Windows NT, OS/2 and DOS

Jinks Technology Management, Inc
2 Tomolonis Dr., Nashua, NH 03062
Phone: (603) 882-8222 Fax: (603) 886-8885
Planning and Development assistance for Windows and Client/Server applications throughout New England. Staff includes Microsoft Certified System Engineer and Product Specialists.

SOLARC (800) 665-0883
Offices in Tulsa & New Orleans
We specialize in developing both departmental and enterprise wide client/server solutions, and provide consulting and training for: Microsoft NT Visual Basic
SQL Server Visual C++

Unibased Systems Architecture, Inc.
14323 So. Outer Forty Rd., Ste. 300 South
St. Louis, MO 63017
Phone: 800-489-6069 Fax: (314) 878-2974
Providing migration of large scale legacy applications to a three tier client/server environment. USA's layered RAD tool (A"SET) provides RDBMS independence, generating standard C code for use with Win 95 and NT server

Consulting

Carnegie Technology Group, Inc.
1266 W. Paces Ferry Rd, Suite 508
Atlanta, GA 30327
Phone: (800) 490-7624 Fax: (404) 988-9889
We are recent PhD's from top schools including Carnegie Mellon, MIT, Georgia Tech. We specialize in solving complex problems using Visual C++, Visual Basic, Smalltalk, SQL Server, and ODBC.

Computermart of Georgia, Inc
7274 Mount Zion Blvd
Jonesboro, GA 30236
Phone: (800) 867-5195 Phone: (404) 478-5681
Fax: (404) 473-1725
Contract programming, consulting service & software development. Specializing in all industries & most applications. 17 years in business, diverse programming capabilities, multi-platform & a list of satisfied customers.

DHS & Associates, Inc.
10255 W. Higgins Rd., Suite 800
Rosemont, IL 60018
Phone: (708) 297-5800 Fax: (708) 297-5807
At DHS & Associates, we design and build practical information systems enabling our clients to anticipate and respond to rapidly changing business environments.

DIS Research Ltd
1500 Broadway, 31st Floor
New York, NY 10036
Phone: (212) 719-9696 Fax: (212) 382-24852
DIS Research is a full service desktop systems integrator serving the business community for the last ten years. With specializations in LAN, WAN design and implementations, systems support and applications development DIS maintains the depth and breadth of services needed to meet all your computing needs.

InterWorks Software, Inc.
1355 Willow Way, Suite 220
Concord, CA 94520
Phone: (510) 671-0810 Fax: (510) 671-4706
Get ready for Windows95! Building on years of cross-platform experience with Fortune 500 companies and the Microsoft Office/Back Office product suites, we will help you improve system and staff productivity through effective System Management Solutions today and tomorrow

Navigist
Sunnyvale, CA (408) 744-1750
Colorado (303) 290-0232
Emphasizing Client/Server, messaging and connectivity technologies, Navigist designs, implements, and supports robust LANs/WANs. A service oriented organization Navigist will be an extension of your IS staff

NewData Strategies
16415 Addison Road, Suite 508
Dallas, TX 75248
Phone: (214) 735-0001 Fax: (214) 735-8008
Client/Server and RDBMS Solutions. NewData Strategies offers Training and Consulting in Microsoft products and major Client/Server and DBMS Tools. We employ Certified PowerBuilder Developers and Microsoft Specialists for integration, SQL Server, and Windows NT support

Synaxis Corporation
Contact: Sam Levine (Sam@Synaxis.COM)
617-449-4480 x140
Technical Competence!
Expert Application Development using Visual Basic. Focus on Imaging and E-Mail. Database Analysis. Design and Development for Access, SQL-Server and others. Customized Visual Basic Front-ends and Development for Lotus Notes

Taylor Management Systems, Inc
2900 River Rd Ste 425
Des Plaines, IL 60018
Phone: (708) 803-1500 Fax: (708) 803-1509
EMAIL: carl@taylormgmt.com
Taylor is among the 25 largest consulting firms in Chicago. As a Microsoft Business Partner, we specialize in Microsoft solutions development, Mainframe to Client-Server conversions and statistical analysis using SAS

SOLSoft, Inc., 10835 NE 38th Pl., Ste. 24B, Kirkland, WA 98033; phone: (206) 822-1257; fax (206) 822-1405

VIRTUALOGIC, Inc
Phone: (301) 571-9476 Fax: (301) 571-8530
6701 Democracy Blvd., Suite 300
Bethesda, MD 20817-1574
Professionals with the skills you seek — where needed — when needed. On-site developers. DBAs or complete teams skilled in MS development tools, PowerBuilder, MS BackOffice, Sybase and Oracle. Contact Mark Rogers.

Custom Software Dev

InfoDesign Inc.
100 Deventry Lane, Suite 101, Louisville, KY 40223 (502) 339-7144 (voice) (502) 339-7194

Personal P.C. Consultants, Inc. 11026 Prairie Hills Dr
Omaha, NE 68144 Phone: (402) 393-4548; Fax: (402) 392-0711

Database Design Dev

Professional Computer Solutions, Inc.
383 Hardwell Place, Suite 105
Englewood, NJ 07631
Phone: (201) 816-8002 Ext 136 Fax: (201) 816-8113
PCSI focuses on developing database applications using Access Visual Basic, Paradox, Microsoft SQL Server, Sybase, Oracle, and other products. We also perform technology planning, requirements analysis, architecture, and performance benchmarking

Quantum Compliance Systems, Inc.
4251 Plymouth Rd.,
Ann Arbor, MI 48105
Phone: (313) 761-21752 Fax: (313) 761-3058
Environmental, Health & Safety Information Management Systems to assist with compliance with SARA, RCRA, CAA, TSCA, OSHA, CERCLA, DOT, and other regulatory requirements.

Education

CheckPOINT 17W240 22nd Street, Oakbrook Terrace, IL 60181. Phone:(708) 279-9030/fax: (708) 279-6359.

End-User Training

EEI
66 Canal Center Plaza, Suite 200
Alexandria, VA 22314-5507
Phone: (800) 683-5859 /(703) 683-0683 Fax: (703) 683-4919
Training, development and consulting for Microsoft Access Windows, Word, PowerPoint, and Excel. Multimedia development and training for Windows and Mac: Director, Toolbook, Premiere—also Photoshop, CorelDRAW, QuarkXPress, Illustrator, PageMaker, Framemaker

reSolution, New York area MS ATEC, (212) 255-1956
Get ready NOW for Windows 95, NT 3.5

E-mail Management

Baranof Software Inc
85 School Street
Watertown, MA 02172
Phone: (800) 462-4565 Fax: (617) 926-6636
Leading provider of E-mail Management products, including MailCheck - multivendor graphical console providing end-to-end connectivity checking, error-levels, alerts, statistics, more! Call Kelly Walters for FREE demo!

Industrial Automation

C.B. Engineering Ltd
#20, 5920-11 Street SE
Calgary, Alberta, Canada T2H 2M4
Phone: (403) 259-6220 Fax: (403) 259-3377
CB Engineering represents industrial automation suppliers which include Intellution, Inc. (SCADA/MMI software) and IBM (Industrial Computers, Monitors, and Data Collection Units) Located in seven major Canadian cities, call 1-800-99CBENG (1-800-992-2364)

Line Business Solutions

Granitek Systems, Inc.
Meredith Sq. 610
160 Rt. 3, Daniel Webster Hwy.
Meredith, NH 03253
Phone: (603) 279-1200 Fax: (603) 279-1201
SALES PARTNER - Integrated Sales and Prospect Management in Microsoft Access for Windows or Windows NT. Sales Force Automation with links to Word, Excel, Great Plains, Dynamics and Micro-MAX MRP

Information Processing Corporation
5930 LBJ Freeway, Suite 300
Dallas, TX 75240
Phone: 1-800-IPC-FICS Fax: (214) 404-9297
IPC's products are: ABACUS provides billing and resource utilization management for data processing centers; FICS a relationship banking solution for financial institutions; Visual Security System, a security product for developers

JMJ Technologies, Inc
Phone. (404) 509-5653/(800) 677-5653 Fax: (404) 973-8194
Quality client/server solutions using OO technology. Uts include PowerBuilder, VB, C++, DBMSs include SQL Server, Sybase, Ingres, Access. Solutions glued with OLE, ODBC, DDE, Wireless LANs, Remote Access

Micro-Frame Technologies, Inc.
430 N. Vineyard, Suite 102
Ontario, California 91764
Phone: (909) 938-2711 Fax: (909) 984-5382
ProjectServer converts Microsoft Project into a client/server solution for managing multiple projects. Features multi-project task updating with automatic posting to Project: on-line status reports, action item tracking, automated file uploading, and timesheets

SQL Financials
Two Ravinia Drive, Suite 1000
Atlanta, GA 30346
Phone (404) 390-3900 Fax. (404) 390-3999
SQL Financials develops and support cross-industry client/server financial applications for a wide range of environments. These high performance applications are fully functional, intuitive, quick to implement and provide a rapid return on customer investment.

Systems Integration

Corporate Software Inc.
2 Edgewater Dr.,
Norwood, MA 02062
Phone: (617) 440-1170 Fax: (617) 440-7083
International provider of microcomputer software, support and systems integration services for businesses and institutions. Services include software support, technical training, pilot implementations, consulting, software integration and migration management.

EDM Inc. 4075 Papazian Way, Ste 205, Fremont, CA 94538 (510) 438-9651 - VB, NT, SQL, PowerBldr., Conversions, Imaging

G A. Parks Consulting Group, Inc.
342 Madison Avenue, Suite 1430
New York, NY 10173
Phone: (212) 286-0777
Improve your existing investment. WFW, NT, Access, hardware, sales, support, service, design, full help desk support.

Indus Consultancy Services
140 E Ridgewood Ave
Paramus, NJ 07652
Phone: (201) 261-3100 Fax: (201) 261-1399
Indus Consultancy Services (ICS), the systems integrator of choice, will help you implement Distributed Databases, Client/Server, GUI and OO Systems. ICS specializes in Microsoft Windows NT, SQL Server, SMS, Access and Visual C++

LANSystems Inc. - (800) ASK 4 LAN

Network Six, Inc.
475 Kilvert Street
Warwick, RI 02886
Phone: (401) 732-9000 Fax: (401) 732-9009
Providing systems integration services to government human services agencies, using information technology - including project management, systems design, software development, hardware procurement/installation, training and data conversion

Random Access, Inc.
8000 East 18th Avenue
Denver, CO 80231
Phone: (303) 745-9600 Fax: (303) 745-0242
Random Access is a leading provider of information technology solutions. Headquartered in Denver, Random Access has branch offices in Colorado Springs and Boulder, Seattle, Portland, Phoenix, Salt Lake City, Boise, Houston, Omaha and Minneapolis.

Systems Research and Applications Corporation
2000 15th St.,
No Arlington, VA 22201
Phone: (703) 803-1500 Fax: (703) 803-1509
SRA provides solutions for industry and government. Specific markets include health, manufacturing, legal and retail, with expertise in integration, telecommunications, networks, imaging, multimedia, full text-document management, and business reengineering

Tech-Comm, Inc. LAN-MAN Network Experts
Birmingham, AL (205) 250-8053

Systems Integration Messaging

Wordlink
2009 Fox Drive
Champaign, IL 61820
Phone: (217) 359-9378 Fax: (217) 373-6279
WORDLINK offers of complete set of networking, information integration and authorized education services designed for Microsoft solutions. WORDLINK has locations in Illinois, Indianapolis, Missouri and California.

Technical Training

Digital Equipment Corporation
129 Parker Street
Maynard, MA 01754
Phone: (800) 332-5656 Fax: (603) 684-6655
Come to us for a complete turnkey solution that includes registration, scheduling, and accounting, as well as course development delivery and testing. It's training at its best-in your best interest

Meliora Systems, Inc
95 Allens Creek Road, Building 2, Suite 302
Rochester, NY 14610
Phone: (716) 461-1900 Fax: (716) 461-1989, E-Mail: 70742.3173@Compuserve.com
As one of the country's premier Microsoft Solution Provider Partners and Authorized Technical Education Centers, Meliora Systems is a leading provider of consulting and training on Microsoft Office and BackOffice.

RRTC, Inc.
1-800-476-4454/Fax: 804-295-3291
Authorized Technical Education Center (ATEC). Microsoft certified training for support professionals. Washington, D.C. and Richmond, Virginia. On-site training available. Classes in NT, NT Server, SQL, SMS, Windows 95, Mail.
Serving Customers Nationwide

Training

Computer Savvy, Inc., 2382 W Oakland Park Blvd., Ft. Lauderdale, FL 33311 Phone: (305) 486-0644; Fax: (305) 486-5659; PC Training Network Certification

Keystone Learning Systems Corp.
2161 Larsen Parkway
Provo, UT 84606
PH: 800-748-4836, 94 801-375-9600 FAX. 801-373-8872
We specialize in Video Training for you Entire Enterprise. Courses available for MS Office, VisualBasic, Project, Back Office, Windows and many more. Call today to start your Video Training Library.

MSU, Windows Training & Development Center, Houston, TX (713) 650-0333 Fax: (713) 650-0080.

Workgroup Automation

Kois & Associates, Inc
156 Fifth Avenue
New York, NY 10010
Phone: (212) 255-1900 Fax: (212) 255-1735
Specialists in workgroup automation & customization with all flavors of Windows (Workgroups, NT), MS apps (Word, Excel, Access, Mail), & MS BASICs (VB, WordBasic, VBA)

Computerworld, Inc

CEO/President Gary J. Beach
Executive Vice President Steven F. Wott
Senior Vice President/Finance Matthew C. Smith
Vice President/Human Resources Susan C. Perry
Executive Assistant to the CEO/President Karen E. Elliott

Computerworld

An IDG Company: The World's Leader in Information Services on Information Technology

Publisher
Kevin McPherson

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-875-4394

Vice-President Editorial Bill Laberis
Vice-President Sales/Associate Publisher David Peterson
Vice-President Marketing Bob Winter
Vice-President Consumer Marketing Gail Odenwald

PUBLISHER'S OFFICE: *Assistant to the Publisher:* Lois Bennett. **SALES CLASSIFIED:** *Classified Operations Director,* Cynthia Delany. **MARKETING:** *Director, Marketing Communications,* Mary Dorle; *Senior Manager, Marketing Communications,* Elizabeth Phillips; *Manager, Trade Show & Conventions,* Audrey Shulman; *Marketing Communications Account Manager,* Susan Thaxter; *Administrative Assistant,* Patty White. **CIRCULATION:** *Director of Circulation Management,* Maureen Burke. **PRODUCTION:** *Production Director,* Christopher P. Cuoco; *Production Manager,* Beverly Wolff. **DISTRIBUTION:** *Distribution Manager,* Bob Wescott; *Traffic Manager,* Pat Walker. **INFORMATION SYSTEMS:** *Vice-President of IS,* Walter Crosby

Sales Offices

Associate Publisher/Vice-President/Sales
David Peterson
Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171 Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-879-0446

Regional Vice President: Sherry Driscoll. Senior District Managers: Bill Cadigan, John Watts. Sales Office Coordinator: Tammy Grynewicz. Sales Assistants: Laura Holliday, Barbara Shulman, 470 Totten Pond Rd., 5th Floor Waltham, MA 02154 (508) 879-0700 FAX: (617) 890-2660 TDD: (800) 498-8544

Mid-Atlantic

Senior District Managers: Fred LoSapio, Vicki Gunn, Rich Molden. Sales Assistants: Susan Kusnic, Jean Dellarobba. Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX: (201) 712-9786 TDD: (800) 208-0288

South-Atlantic

Regional Vice President: Bernie Hochswender. Sales Assistant: Jennifer Pattenaude, 3675 Crestwood Parkway, Suite 400 Duluth, GA 30136 (404) 931-8104 FAX: (404) 931-8108 TDD: (800) 449-4974

Midwest

Senior District Manager: Sharon R. O'Brien. Sales Assistant: Denise Richards, 980 N. Michigan Avenue, Suite 1400 Chicago, IL 60611 (312) 214-3606 FAX: (312) 214-4962

Southwest

Senior District Manager: Darren Ford. Sales Assistant: Brenda Shipman, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-6862 FAX: (214) 701-9000 TDD: (800) 922-4946

Northern California

Vice-President/Western Advertising Sales: Richard Espinosa. Senior District Managers: Ernie Chamberlain, Kaye Sharbrough, Linda Holbrook. District Manager: Christine Curry. Elizabeth Cooper. Lisa Kowalski. West Coast Operations Manager: Letecia Lebane. Sales Associates: Denise Hu, Emily Gaynan, Shannon Dempsey, Denise Garcia, Andrea Zurek, Jim Schotz, Colleen Molnar 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312 TDD: (800) 800-3179

District Manager: Nancy Coy. Sales Associate: Rachel Gillis-Swartz, 2171 Campus Drive, Suite 300, Irvine, CA 92715 (714) 250-3942 FAX: (714) 476-8734

Advertising Operations

Display Advertising Production Manager: Paula Wright. Display Advertising Coordinators: Lisa Turner, Peggy Hennessy, Gregg Pinsky, (508) 879-0700 FAX: (508) 879-0446

Custom Publications

Boston: Vice-President/Larry Crawen, Director of Publishing Services/Carolyn Swrack, Project Coordinator/Heidi Broadley, Managing Editor/Peter Buchner, Graphic Designer/Gail Varney, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 879-0446

San Francisco: West Coast Director/Elaine R. Offenbach, Sales Associate/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Client/Server Journal

Associate Publisher: James Hussey, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-2368
East: John Watts, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154, (508) 879-0700 FAX: (617) 890-2660
West: Lisa Kowalski, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Marketplace Advertising

Sales Manager/Michelle Reeves. **Northeast** Account Executive/Susan Cardona. **Central/Southeast** Account Executive/Kevin Gasper. **Western** Account Executive/Claude Garbarino. Marketing Communications Manager: Karen Lesko. Classified Solutions/Nancy Whittaker, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474 FAX: (508) 880-0941

Recruitment Advertising Sales Office

Vice-President/Recruitment Advertising/John Corrigan. Marketing Director/Derek E. Holitzky. 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474. Account Executive/Nancy Mack, (800) 343-6474

Mid-Atlantic: Regional Manager/Mary Fum, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090. Account Executive/Caryn Dion, (800) 343-6474 TDD: (800) 208-0288

South-Atlantic: Regional Manager/Katie Kreen, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115. Sr. Account Executive/Pauline Smith (800) 343-6474

Midwest: Regional Manager/Pat Powers, 1901 East Touhy Avenue, Suite 650 Des Plaines, IL 60018 (708) 827-4421. Sr. Account Executive/Ellen Crum (800) 343-6474 TDD: (800) 257-0437

West: Regional Manager/Barbara Murphy, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0184. Sr. Account Executive/Christopher Gleon (800) 343-6474 TDD: (800) 203-5987

Computer Careers Online: Jay Sarvil, Account Executive, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

Other Regional Offices

375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

Account Manager/Susan Tamborrino, Sales Assistant/Christine McGovern, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

Computerworld Database Group

Vice-President/General Manager, Customer Information Division: Richard Mikita. Vice-President Sales: John Carpenter. Sales Assistant: Jennifer Class
East: Account Executive/VAR Database, Carol Mullen. Database Representatives, Buyers Database, Linda Clinton (508) 879-0700 FAX: (508) 879-0194
West: Account Executive/VAR Database: Chris Jones. Database Representative, Buyers Database: Gina Rana (415) 347-0555 FAX: (415) 347-8312

Research Technologies

President: Charles Coleman. Chief Operating Officer: Jane Tyler (508) 626-1700 FAX: (508) 626-0127 Internet: rti@delphi.com CompuServe 74400,2745

International Data Group

Chairman of the Board, Patrick J. McGovern; **President,** Kelly Conlin; **Chief Operating Officer,** Jim Casella; **Vice-President Finance,** Gene Garkus

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 200 computer publications in 80 countries. Forty million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina, Infoworld Argentina; AUSTRALIA'S Computerworld Australia, Australian PC World, Australian Macworld, Network World, Mobile Business Australia, Publish; Reseller; IDG Sources; AUSTRIA'S Computerwelt Oesterreich, PC Test; BELGIUM'S Data News (CW); BOLIVIA'S Computerworld; BRAZIL'S Computerworld, Gamepro, Game Power, Mundo Unix, PC World, Publish, Super Game; BULGARIA'S Computerworld Bulgaria, Infoworld, PC & Mac World Bulgaria, Network World Bulgaria; CANADA'S CIO Canada, Computerworld Canada, Graphics International, Infoworld Canada, Network World Canada, Reseller; CHILE'S Computerworld Chile, Information; COLOMBIA'S Computerworld Colombia; PC World; COSTA RICA'S PC World; CZECH REPUBLIC'S Computerworld, Elektronika, Macworld; PC World; DENMARK'S Communications World, Computerworld Danmark, LOTUS World, Macintosh, Publishing, Macworld Danmark, PC World Danmark, PC World Produktguide, Tech World, Windows World; ECUADOR'S PC World; EGYPT'S Computerworld (CW) Middle East, PC World Middle East; FINLAND'S Mikro PC, Tietoviikko, Tietoverkko; FRANCE'S Bureautique, GOLDEN MAC, InfoPC, Langages & Systèmes, Le Monde du Macintosh, Le Monde Informatique, Le Monde Informatique, Telecoms & Reseaux; GERMANY'S Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, Electronic Entertainment, Computer Information Management, Macwelt, Network PC, PC Welt, PC Woche, Publish, Unix; GREECE'S Infoworld, PC Games; HONG KONG'S Computerworld Hong Kong, PC World Hong Kong; HUNGARY'S Computerworld SZT, PC World; INDIA'S Computers & Communications; INDONESIA'S Info Komputer; IRELAND'S Computerworld; ISRAEL'S Computerworld Israel, PC World Israel; ITALY'S Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC Shopping Italy, PC World Italia; JAPAN'S Computerworld Today, Information Systems World, Macworld Japan, Nikkei Personal Computing, Sunworld, Japan Windows World; KENYA'S East African Computer News; KOREA'S Computerworld Korea, Macworld Korea, PC World Korea; LATIN AMERICA'S GamePro; MALAYSIA'S Computerworld Malaysia, PC World Malaysia; MEXICO'S Compu Edition, Compu Manufactura, Computerworld/Power de Venta, Computerworld Mexico, MacWorld, Mundo Unix, PC World Windows; THE NETHERLANDS' Computer Totaal, Computable (CW), LAN Magazine, MacWorld, Totaal Windows; NEW ZEALAND'S Computer Listings, Computerworld New Zealand, Network World, New Zealand PC World; NIGERIA'S PC World Africa; NORWAY'S Computerworld Norge, C/World, Lotusworld Norge, Macworld Norge, Nettverk, PC World Norge, PC World i Produktfokus, Publish & Multimedia World, Student Data, Unix World, Windowsworld, DC Direct Response; PAKISTAN'S PC World Pakistan; PANAMA'S PC World Panama; PERU'S Computerworld Peru, PC World; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, China Infoworld, China PC & Communications Magazine, Computer Fan, PC World China, Electronics International, Electronics Today Multimedia World, Developer, Product World, China Network World, Software World Magazine, Telecom Product World; PHILIPPINES Computerworld Philippines, PC Digest (PCW); FINLAND'S Computerworld Finland, PC World/Suomen Tietoverkot; PORTUGAL'S Computerworld Portugal, PC World; ROMANIA'S Computerworld, PC World, Telecom Romania; RUSSIA'S Computerworld Moscow, Mir PC (PCW), Sety (Networks); SINGAPORE'S Computerworld S.ediment Asia, PC World Singapore; SLOVENIA'S Monitor Magazine; SOUTH AFRICA'S Computer Mail (CIO), Computing S.A., Network World S.A., Software World; SPAIN'S Advanced Systems, Amiga World, Computerworld Espana, Communications World, Macworld Espana, NeXTWORLD, Super Juegos Magazine (GamePro), PC Worlds Espana, Publish; SWEDEN'S Attack, Computerworld, Corporate Computing, Macworld, Mikrodatorn, Natverk & Kommunikation, PC World, Publishing & Design (TAP), Datalexipparen, Mac Data, Windows World; SWITZERLAND'S Computerworld Schweiz, Macworld Schweiz, PC Tip; TAIWAN'S Computerworld Taiwan, PC World Taiwan; THAILAND'S Thai Computerworld; TURKEY'S Computerworld Monitor, Macworld Turkiye, PC World Turkiye; UKRAINE'S Computerworld; UNITED KINGDOM'S Computing/Computerworld, Connexion/Network World, Lotus Magazine, Macworld, Open Computing/Sunworld; UNITED STATES' Advanced Systems, Amiga World, Cable in the Classroom, CD Review, CIO, Computerworld, Digital Video, DOS Resource Guide, Electronic Entertainment Magazine (E2), Federal Computer Week, GamePro, IDG Books, Infoworld, Laser Focus, Macworld, Multimedia World, Network World, PC Letter, PCWorld, Playlight, Power PC World, Publish, SWATPro, Video Event; VENEZUELA'S Computerworld Venezuela, PC World Venezuela; VIETNAM'S PC World Vietnam

Have a Problem With Your Computerworld Subscription?

We want to solve it in your complete satisfaction and we want it fast. Please write us:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label. If possible, m by a copy of the information which appears on the label, including the coded line.

Your Box Address Goes Here

Address shown ❑ Home ❑ Business

Name

Company

Address

City State Zip

Name	
Title	Company
Address	
City	State Zip

Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly, the following toll free number is available: **1-800-669-1002** (Canada U.S. call (614) 383-3225)

Computerworld members can reach us at our voice number (508) 879-0700

Advertisers' Index

Adobe	70
Andersen Consulting	79, 81
Apple Enterprise Awards	63
AST Research	51
AT&T	34-35
AT&T Paradyne	21
Bay Networks	54
BBN Planet	40
Bruteve	62
Cabletron	66-67, 69
CEO/CFO Survey	33
Chipcom	C3
Computer Associates	3, 9
CW Classified	58, 61, 80
CW Client/Server Journal Top 20	104
CW Editorial Calendar	74-75
D&B Software	44
Dell	61-63
EMC Corp.	89
Exide Electronics	24
FTP Software	100
Gemcom	89
Hewlett Packard	46-47, 62-63, 82-83
IBM	26-27, 48, 57, 59
ICS/Deloitte	50
Information Builders	17
Informix Software	98
Interface Systems	55
Intersolv	60
Kingston Technologies	C4
Lawson	18-19
Logic Works	72
Lotus Development Corp.	15
Micom	60
Micro Focus	7
Microsoft	30-31, 70-71, 90-91, 97, 103
NetManage	60
Nokia Display Products	41
Novell	25
Oracle	5
Pilot Software	10
Printronix	61
Ross Systems	29
SAS Institute	44/45, 76, 89
Smithsonian Awards	98-99
Speedware	38-39
Sprint	13
Stratus Computer Corp.	94
Sybase	130
3Com	87
Toshiba	42-43
Unisys	22-23
Workstation Group	93
Zenith Data Systems	11

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Marketplace Advertisers' Index Pages 119-126

Alternp, Inc.	(800) 274-0555
Allen Systems Group	(800) 885-5560 X411
American Software	(404) 304-8770
Bourne & Wahlstrom	(800) 910-7800
Budight	(800) 782-6757
Bruce-Pak	(800) 758-1322
Carlson Computer Int.	(800) 334-7073
ClockMaster	(800) 304-0449
Company Museum Systems	(800) 893-3000
Personal Systems	(708) 574-0606
Keystone Learning Systems	(800) 745-4055
Kwantil	(800) 835-3000
Leibniz Technologies	(800) 776-4344
Paralight	(800) 795-5000
Secure It	(800) 451-7800
Spectra Equipment	(800) 746-1200

Companies in this issue

Page number refers to page on which story begins

3Com Corp. 8,12
3M Co. Cover1

A

A. T. Kearney, Inc. 8
Aberdeen Group, Inc. 77
Advanced Micro Devices, Inc. 8
Alantec, Inc. 12
Alexander & Alexander Services, Inc. 8
Allegiant Technologies 32
Alliance for the Chesapeake Bay 102
AlliedSignal Aerospace 107
American Express Co. 6
American Greeting Corp. 2
American Management Systems, Inc. 105
America Online, Inc. 14,41
Ameritech Corp. 102
Analytical Technologies, Inc. 4
Andersen Consulting 4,73,84
Anheuser-Busch Cos. 6
Apple Computer, Inc. Cover1,15,58,61
Applied Business Technology Corp. 80
Applied Cellular Technology, Inc. 32
Applied Network Technology, Inc. 32
Area Bancshares Corp. 8
ASK Group, Inc. 77
AT&T Corp. 8,56,58,77,84,109
AT&T Global Information Solutions 29
AT&T Solutions 73
Auspex Systems, Inc. 50

B

Baler Software Corp. 32
Banyan Systems, Inc. 29
Barclays Bank 8
Bell Atlantic Corp. 45
Blue Orchard Software, Inc. 45
BMC Software, Inc. 2
Boole & Babbage, Inc. 2
Borland International, Inc. 80
Braun Technology Group 32
BSG 4
Buckman Laboratories 86
Burl Software Laboratories, Inc. 32

C

Caldera, Inc. 58
Cambridge Technology Partners 4
Candle Corp. 2
Carolina Steel Corp. 65
Cary Prague Books and Software 29
Cascade Communications, Inc. Cover1
Centocor, Inc. 49
Central Intelligence Agency 55
Chevron Corp. 73
Chevron Information Technology Corp. 29
Cheyenne Software, Inc. 52
Cisco Systems, Inc. 12
Claris Corp. 120
Cognitive Communications, Inc. 88
Cognos Corp. 68
Compaq Computer Corp. 29
CompuServe, Inc. 14,41
Computer Associates International, Inc. 2,129
Computer Language Research 52
Computer People, Inc. 77
Convex Computer Corp. 8
Copyright Clearinghouse Center 58
Crittenwood Communications 8
Cozzi Research 80
Cray Research, Inc. 102,105
Creative Assistance Software 61
Creative Networks, Inc. 49
Crystal Computer Services, Inc. 50
CS First Boston 65
CSX Transportation, Inc. 73
Cummins Engine Co. Cover1

D

Dassault Systemes 107
Data General Corp. Cover1
Dataquest, Inc. 120
DayStar Digital, Inc. Cover1
Denmon Tire Corp. Cover1
Digital Equipment Corp. 8,56,68,80,105
Dow Chemical Corp. 84
DreamWorks SKG 8
Dreyfus Corp. 2
Du Pont Co. 105
Duke Power Co. 4
Dun & Bradstreet Software 24,73

E

Eastman Kodak Co. 8
Electronic Data Systems Corp. 4,8,73,102
Electronic Publishing Resources, Inc. 58
Elf Exploration, Inc. 41
Emulex Network Systems Corp. 61
Equifax, Inc. 73
Ernst & Young 4,84,86

F

Federal Bureau of Investigation 55
Federal Communications Commission 8,15
Federal Reserve System 55
Fidelity, Inc. 84
FirePower Systems, Inc. Cover1
First Albany Corp. 129
First National Bank of Chicago 73
Florida Power & Light Co. 79
Footprint Software, Inc. 8
Ford Motor Co. 84
Fore Systems, Inc. 32
Forrester Research, Inc. 88
Frame Technology Corp. 32
Fujitsu Personal Systems, Inc. 8
Fulcrum Technologies, Inc. 32
Fulmedia S.A. 32

G

G. E. Lighting 84
Gartner Group, Inc. 4,12,45,49,86
Gemini Consulting 84
Gemini Management Consulting, Inc. 6
General Datacom Corp. Cover1
General Mills, Inc. 32
General Motors Corp. 84
Goal Systems International, Inc. 2
Gordon & Glickson Cover1,58
Grace Consulting 24
Great Western Bank 73

H

Hallmark Cards, Inc. 84
Healthsource, Inc. 32
Hewlett-Packard Co. 8,12,84
Horizons Technology, Inc. 49
Hughes Information Technology Corp. 107
Huntington Bancshares 8

I

IBM 2,4,6,8,14,32,56,61,65,68,79,84,107
IBM PC Co. Cover1
In-Stat Research Inc. Cover1
Informix Software, Inc. 32,77
Innovative Information Systems, Inc. 4
Instinet Corp. 4
Integral Peripherals 8
Integrated Systems Solutions Corp. 4,8
Intel Corp. Cover1,15,45,58,129
Intellectual Property Licensing Agency, Inc. 58
IntelliWare Systems, Inc. 65
International Data Corp. 29,45,49,65,73,120
International Technology Group 94
Internet Casino, Inc. Cover1
Intrusion Detection, Inc. Cover1,131
IPC Technologies, Inc. Cover1
Isocor 56

J

Janesway Electronics Corp. 47
Jetsoft Development Co. 47
Jupiter Communications Ltd. 14

K

K Computing, Inc. 58
Kao 84
Kirby Corp. 4
Knight-Ridder Information, Inc. 58
KOM, Inc. 50

L

Lannet Data Communications Ltd. 12
Lawrence Berkeley Laboratory 52
Legent Corp. 2
Linux Journal 58
Lockheed Martin Missiles and Space Cover1
Logicode Technology, Inc. 47
Long's Drug Stores 32
Loral Conic TerraCom. 49
Lotus Development Corp. 12,29,45,79,94,96

M

Macromedia, Inc. 14
Mapinfo Corp. 129
Mastersoft, Inc. 32
Maximum Computer Technologies, Inc. 50
McAfee Associates, Inc. 32,49
McDonnell Douglas Aerospace 107
McKinsey & Co. 84
Medtronics, Inc. 131
Messaging Concepts 56
Meta Group, Inc. 2,14,20,73
Metropolitan Life Insurance Co. 79
Metropolitan Museum of Modern Art 6
Micro Focus, Inc. 32
Microsoft Corp. 2,6,8,12,29,32,41,45,47,49,56,61,68,77,79,80,94,96,120
Mips Technologies, Inc. 45
Mitchell International 24
Monsanto Corp. 84,86
Motorola, Inc. Cover1,6

N

NEC Corp. 45
NEC Technologies, Inc. 45
NetCom 14
NetEdge Systems, Inc. Cover1
Netscape Communications Corp. 8,14,20
NetZ Computing 41
Northeast Consulting Resources, Inc. 79
Northeast Utilities Cover1
Northern Telecom, Inc. Cover1,8
Novadigm, Inc. 79
Novell, Inc. Cover1,8,29,49,52,58,61,79,94,120,131
Nutmeg Mills, Inc. 49

O

Object Focus, Inc. 77
On Technology, Inc. 49
One Communications Corp. 56
OneUp Corp. 45
Onsale 20
Opera Systems, Inc. 68
Oppenheimer Management Corp. 32
Oracle Corp. 8,32,77,129
Owens-Corning Fiberglas Corp. 86

P

PaineWebber, Inc. 12
Palindrome Corp. 52
ParaTechnology, Inc. 4
Persistence Software, Inc. 77
Pictorial, Inc. Cover1
Pillsbury Co. 131
Platform Computing Corp. 65,68
Polaroid Corp. 86
Power Computing Corp. Cover1
PowerQuest Corp. 47
Powersoft Corp. 79
Price Waterhouse 12,84
Prodigy Services Co. 14
Project Software & Development, Inc. 129

Q

QlikTech, Inc. 47
Quadrant Software 68

R

Radius, Inc. Cover1
RainbowBridge Communications, Inc. 32
Raymond James & Associates, Inc. 129
Reasoning Systems, Inc. 80
Red Brick Systems 32,77
Revolutionary Concepts, Inc. 41
Rogue Wave Software, Inc. 77
Roseware Cover1

S

Saber Software Corp. 32
SAP AG 73
Sara Lee Corp. 32
Schlumberger Ltd. 73
Security Forces, Inc. Cover1
Sequent Computer Systems, Inc. 77
Silicon Graphics, Inc. 8,105
Singapore Airlines 81
Skandia Corp. 84,85
Skandia Group Insurance Corp. 84
SkyTel, Inc. 105
Smaby Group, Inc. 65
SoftArc, Inc. 61
Software AG of North America, Inc. 65
Software Productivity Research, Inc. 80
Spry, Inc. 14
Square D Co. 4
Sterling Software, Inc. 65
StrataCom, Inc. Cover1
Strategic Networks Consulting, Inc. Cover1
Strategic Research Corp. 52
Summit Software Co. 80
Summit Strategies, Inc. 49
Sun Microsystems, Inc. Cover1,8
SunSoft, Inc. 77
Sybase, Inc. 8,29,32,77
Symantec Corp. 49
System One Corp. 2

T

TAC Systems, Inc. 61
Tatung Science and Technology, Inc. Cover1
Technologic, Inc. 61
Technology Enterprises, Inc. 12
Technology Solutions Co. 4
TeleSpan Publishing Corp. 58
The Boeing Co. 107
The Chase Manhattan Bank NA 73,86
The Clipper Group, Inc. 65
Tivoli Systems, Inc. 79

U

United HealthCare Corp. 73
U.S. Bank of Oregon 77
U.S. Department of Defense 55
U.S. Department of Justice Cover1
U.S. Information Agency 16
US West, Inc. 8
USF&G Corp. 29

V

Vine Computer Co. 41
VocalTec, Inc. 14

W

Wachovia Corp. 8
Wang Laboratories, Inc. 32
Wells Fargo Bank NA 77
White Pine Software, Inc. 58
Wiz Vax Communications 58
WorkGroup Solutions, Inc. 58

X

Xerox Corp. 65,68
XPoint Corp. 68
Xyplex, Inc. 56

Y

Young & Rubicam, Inc. 12

Z

Zenith Data Systems Cover1

Gainers

Percent

Aracoma Inc.	50.0
Encore Computer Corp.	25.0
Magic Software Enterprises	75.0
Rainbow Technologies Inc.	26.0
Information Resources	18.6
Qubius Inc.	12.8
Frame Technology(W)	12.0
Pemtel Data Comm Networks	10.0

Losers

Percent

NetManage Inc.	-15.7
Network Computing Devices	-13.6
Applix Inc.	-12.2
Reson Inc.(L)	-12.1
Computer Network Tech.	-9.5
Ross Systems	-9.1
Software International Inc	-8.6
TriCord Systems	-7.9

Dollar

US Robotics	4.75
Rainbow Technologies Inc.	6.50
Atmel Corp.	3.00
Stratacom Inc.	2.75
Frame Technology(W)	2.63
Information Resources	2.44
Ascend Communications	2.50
Hyperion Software Corp	2.25
Computer Associates	-5.00
Microsoft Corp.	-4.00
Applix Inc.	-2.88
NetManage Inc.	-2.63
Sun Microsystems Inc.	-2.50
Software International Inc.	-2.25
Adobe Systems Inc.	-1.88
CompUSA Inc.	-1.75

Tech stocks on chopping block

Stocks in the technology sector got hammered early last week, although the rest of the market performed fairly well. However, by the end of the week, most shares had started back on their trend upward again.

That activity seems to be a combination of profit taking and a jittery reaction to economic news, analysts said.

"It is a bump in the road," said Bruce Hadburg, an analyst at Raymond James & Associates, Inc. in St. Petersburg, Fla., adding that he thinks technology stocks are still strong. "Corporate profits are basically decent, and consumers are still buying PCs," he said.

David Benhaim, vice president of First Albany Corp. in Boston, said the constant influx of computer technology into the nation's infrastructure is still in its early stages, and there is a lot of growth left in the industry. This long-term view, he added, could stabilize many technology shares.

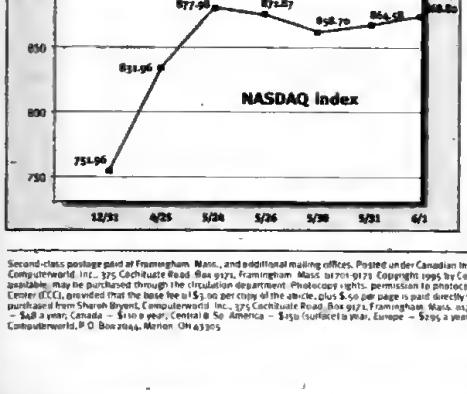
Most of the shares that took a hit last week were large, well-known stocks such as **Intel Corp. (INTC), Oracle Corp. (ORCL)** and **Computer Associates International, Inc. (CA)**, Benhaim said. On the other hand, smaller capitalized stocks such as **MapInfo Corp. (MAPS)** and **Project Software & Development, Inc. (PSDI)** were largely untouched because although they have potential for long-term growth, it is harder for them to turn a fast profit, he said.

Hadburg said the wide array of technologies represented on the stock market must be better integrated and better understood by investors before they blindly put their money into the latest hot technology.

"Isn't the market supposed to look ahead for six to nine months? I think they have abandoned that for technology," he said. — *Tim Ouellette*

NASDAQ on the attack

The NASDAQ Index, which lists a large number of major computer technology stocks, dropped early last week after riding the popularity of these shares for months. Still, by week's end the index was moving up again, well above its mark at the end of 1994.



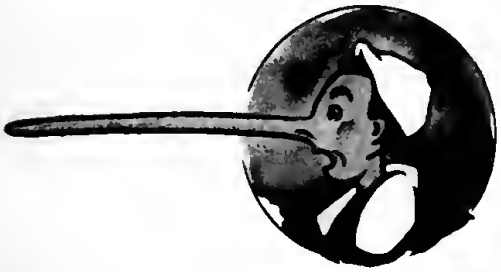
Exch	52-Week Range			June 2 Close	We Net Change	We Pct Change
Communications and Network Services						UP 2.12%
OTC	69.25	20.13	3Com Corp	67.00	0.00	0.0
NYS	66.38	37.88	AMERITECH Corp	61.88	0.23	0.6
NYS	37.00	67.25	AT&T	51.13	1.50	3.0
OTC	43.25	5.63	Ascend Communications	47.88	3.50	8.0
OTC	10.75	12.75	Banyan Systems Inc.	16.50	0.13	0.8
OTC	40.00	18.63	Bay Networks Inc.	50.00	-0.19	0.3
NYS	58.38	48.58	Bell Atlantic Corp	55.13	1.38	2.6
NYS	63.50	50.50	BellSouth Corp	60.25	1.00	1.2
NYS	22.25	10.00	Bolt, Beranek & Newman	17.25	-0.50	2.1
OTC	19.75	9.00	Brooktrout Technology	15.25	0.00	0.0
NYS	55.75	33.00	Cabletron Systems	54.25	0.50	0.9
OTC	23.50	10.00	Centigram Communications	12.25	1.00	7.3
OTC	50.50	20.00	Chorum Corp (L)	21.63	1.50	7.5
OTC	48.13	18.75	Cisco Systems Inc.	46.00	0.11	0.1
OTC	13.00	8.13	Compression Labs Inc.	8.50	-0.56	-6.0
OTC	10.88	5.13	Computer Network Tech.	9.25	1.00	9.3
OTC	14.50	7.50	CrossCom	11.50	0.16	1.6
OTC	6.31	2.13	Data Switch Corp	4.25	0.10	4.6
OTC	42.50	17.88	DSC Communications	38.44	1.28	3.2
OTC	41.75	10.00	FORE Systems Inc	26.25	0.25	0.8
NYS	35.88	9.25	General Datacomm Inds.	10.75	-0.88	7.5
NYS	34.88	29.50	GTE Corp	31.34	1.00	3.1
NYS	114.50	77.00	ITT Corp	110.88	0.75	0.7
OTC	25.88	17.25	MCI Communications Corp	20.00	0.38	1.9
OTC	15.75	1.50	MICOM Communications Corp (L)	5.75	0.00	0.0
OTC	12.63	5.19	Microcom Inc	11.50	0.06	0.6
OTC	10.50	4.00	Network Corp	7.13	0.25	3.6
OTC	8.61	3.25	Network Computing Devices	6.38	-1.00	-13.6
NYS	27.88	8.00	Networks Equipment Tech	24.38	0.50	2.1
NYS	30.63	14.25	Network General	25.13	0.00	0.0
NYS	43.75	26.50	Newbridge Networks Corp	37.13	2.13	6.1
NYS	41.00	27.63	Northern Telecom Ltd.	37.00	0.25	2.0
OTC	23.25	13.38	Novell Inc.	19.25	-0.25	1.8
NYS	43.13	35.50	Nynex Corp	41.75	1.38	3.4
OTC	24.25	13.50	Octel Communications Corp	23.63	0.13	0.5
OTC	25.00	6.00	Optical Data Systems Inc.	22.75	-0.25	1.1
OTC	4.75	2.13	Pemtel Data Comm Networks	4.13	0.38	20.0
OTC	50.13	11.75	Picturetel Corp	44.13	1.25	2.8
OTC	8.13	2.13	Proteon Inc	6.25	0.00	0.0
OTC	7.50	2.25	Racotek Inc	5.63	0.25	4.7
OTC	7.38	3.50	Reson	3.25	-0.25	6.3
NYS	24.88	16.31	Schlumberger Atlantic Inc	19.25	-0.38	1.9
NYS	46.35	39.75	Southwestern Bell Corp	43.00	1.13	2.6
NYS	40.13	25.88	Sprint Corp	32.13	0.50	1.2
OTC	31.63	13.50	Standard Microsystems Corp	18.13	0.13	0.7
OTC	47.00	10.00	Stratacom Inc.	41.00	2.75	7.2
OTC	8.13	3.88	Telebit Corp	7.06	-0.31	4.2
OTC	89.25	20.00	US Robotics	89.25	4.25	5.0
NYS	41.38	34.63	US West Inc.	40.88	1.50	3.5
OTC	23.50	10.25	Xircom	30.63	-0.13	1.2
OTC	28.00	8.00	Xylogics Inc	22.75	0.50	2.2
PC and Workstations						Off 0.78%
OTC	6.13	1.50	Advanced Logic Research	1.88	0.13	2.1
OTC	88.00	24.63	Apple Computer Inc	42.13	-0.50	1.2
OTC	19.25	10.50	ASI Research Inc	10.50	0.00	0.0
NYS	46.38	29.50	Compaq Computer Corp.	40.38	0.13	0.3
OTC	50.63	23.50	Dell Computer Corp	32.63	-0.38	-0.2
OTC	25.25	9.25	Gateway 2000 Inc.	18.00	0.25	1.4
NYS	72.50	35.94	Hewlett Packard Co	80.50	1.75	2.8
OTC	16.25	7.50	Micron International Inc.	16.75	-0.50	3.1
NYS	80.13	18.75	Silicon Graphics	38.88	1.25	3.3
OTC	50.50	18.25	Sun Microsystems Inc	44.88	-2.50	5.3
NYS	37.50	23.38	Tandy Corp	46.50	-0.50	0.8
Large Systems						Off 0.29%
ASE	13.63	5.25	Amdahl Corp	12.63	-0.56	4.3
NYS	8.88	3.63	Convex Computer (L)	3.75	-0.13	3.2
OTC	0.22	0.10	Cray Computer	0.19	0.00	0.0
NYS	24.50	24.63	Cray Research Inc.	23.38	0.63	2.7
NYS	12.00	6.75	Data General Corp	7.00	-0.25	-3.1
NYS	49.50	38.38	Digital Equipment Corp	45.00	1.00	2.2
OTC	5.56	1.72	Encore Computer Corp	2.44	0.50	25.8
OTC	18.50	6.50	Harris Computer Systems Corp	15.50	0.63	4.3
NYS	97.88	56.50	IBM	96.88	-0.88	-0.9
OTC	7.88	3.00	Meridian Data Inc.	3.50	-0.25	-6.7
OTC	12.25	6.25	NetFrame	5.13	0.38	6.8
OTC	21.75	11.75	Sequent Computer Sys.	15.38	0.06	0.4
OTC	5.38	3.13	Sequoia Systems Inc	3.60	-0.19	-4.8
NYS	39.88	25.25	Stratus Computer Inc.	30.50	0.00	0.0
NYS	19.75	11.13	Tandem Computers Inc	17.00	0.25	1.8
OTC	14.13	3.88	TriCord Systems	4.50	-0.38	7.9
NYS	12.13	8.25	Unisys Corp	10.75	0.00	0.0
Software						UP 0.61%
OTC	58.75	29.50	Adobe Systems Inc.	53.00	-1.88	3.8
OTC	5.88	2.50	American Software Inc	4.25	0.38	9.7
OTC	39.75	9.50	Applix Inc.	20.75	2.88	12.2
OTC	44.00	23.25	Autodesk Inc.	38.25	0.13	0.3
OTC	7.88	4.75	Bachman Info. Systems	5.63	-0.25	-4.3
OTC	32.00	22.00	BGS Systems Inc.	32.00	1.63	5.3
OTC	70.50	40.25	BMC Software Inc.	48.75	-0.75	-1.5
OTC	50.75	16.50	Boole & Babbage	30.25	0.25	0.8
OTC	14.38	6.00	Borland Int'l, Inc	12.00	0.00	0.0
OTC	22.00	5.75	Brock Control Systems Inc.	7.44	-0.11	-4.0
OTC	3.75	1.78	CE Software	2.88	0.13	4.5
ASE	20.25	6.25	Cheyenne Software Inc.	15.63	1.00	6.8
OTC	36.25	8.75	Cognos Inc	35.13	0.50	2.0
NYS	73.63	37.50	Computer Associates	68.75	5.00	7.7
NYS	6.50	2.50	Computerized Sys Corp	3.75	0.50	9.5
OTC	49.25	21.88	Computrade Corp.	30.00	1.25	4.0
OTC	19.00	8.00	Condisans Inc.	17.50	1.00	5.4
OTC	16.75	10.13	Corel Corp	13.75	0.25	1.8
OTC	36.75	7.25	Dataware Technologies Inc	13.00	0.25	1.9
OTC	3.13	1.88	Easel Corp	1.25	0.00	0.0
OTC	26.25	14.25	Felmet Corp	21.13	-0.88	3.7
OTC	8.75	3.00	4th Dimension	4.00	0.13	3.0
OTC	23.25	8.50	Fraud Technology (W)	24.50	2.63	12.0
OTC	35.50	11.50	FTP Software Inc.	22.25	1.25	5.3
OTC	10.25	7.00	Group 1 Software	9.00	0.38	3.9
OTC	16.50	6.75	Gupta	9.13	-0.63	-6.4
OTC	30.75	4.63	Hogan Systems Inc	8.50	0.13	1.6
OTC	89.75	21.25	Hyperion Software Corp	57.75	2.25	4.1
OTC	37.75	11.75	Informatica Resources	15.56	2.94	18.6
OTC	49.25	34.25	Informix Corp	47.50	1.94	4.3
OTC	14.38	7.38	Intergraph Corp	13.00	0.00	0.0
OTC	6.50	2.50	Interleaf Inc	6.19	0.11	1.1
OTC	19.25	8.63	Intersolv Inc	14.00	1.13	6.7
OTC	86.25	29.50	Intuit Inc.	64.75	0.75	1.2
OTC	67.00	10.00	Legent Corp (H)	41.13	0.31	0.7
OTC	18.50	7.00	Lotus Development	30.00	-0.63	2.0
OTC	10.50	3.63	Magic Software Enterprises	5.63	3.13	25.0
OTC	16.50	6.75	Mapinfo Corp (H)	11.00	0.50	4.1
OTC	17.50	14.75	Mapinfo Corp (H)	17.50	2.25	6.4
OTC	4.63	1.44	Maxtech	3.00	0.13	4.7
OTC	11.50	8.75	McAfee Associates	27.50	1.63	5.0
OTC	18.75	9.38	Mentor Graphics	17.13	0.50	2.2
OTC	20.00	8.75	Micro Focus	12.00	0.25	2.1
OTC	8.00	4.63	Microgrid Inc	8.19	-0.06	-1.0
OTC	80.50	46.88	Microsoft Corp	81.88	4.00	4.8
OTC	22.50	9.63	NetManage Inc	16.13	2.63	-15.7
OTC	10.50	22.88	Oracle Corp	39.88	-0.50	1.8
OTC	49.00	21.50	Parametric Technology	46.00	0.75	1.7
OTC	20.25	9.00	PeopleSoft Systems Inc	12.75	-0.25	1.9
OTC	50.50	16.88	Peregrine	57.25	-0.25	-0.3
OTC	10.00	4.50	Phoenix Technologies	8.75	-0.63	-6.2
OTC	14.75	5.50	Platinum Software	12.25	0.25	2.1
OTC	25.25	12.00	Platinum Technology	16.16	0.50	3.0
OTC	59.50	37.50	Progress Software Corp	40.25	-1.63	3.9
OTC	8.75	1.88	Quantech Corp	6.25	0.50	4.0
OTC	22.63	9.50	Rainbow Technologies Inc	22.61	4.50	24.6
OTC	5.38	2.00	Rasterops	4.25	0.00	0.0
OTC	6.13	2.88	Ross Systems	3.75	0.38	-9.1
OTC	32.00	0.50	Saphire Intl. Corp N V	1.13	0.11	0.2
OTC	29.11	11.50	Software International Inc	24.00	2.25	8.6
OTC	6.25	2.88	Software Publishing Corp	3.75	0.25	2.1
OTC	12.50	5.00	State of the Art	50.25	-0.38	1.8
NYS	38.38	24.00	Sterling Software Inc.	36.81	0.50	1.1
OTC	15.00	3.63	Struct. Dynamics Research	14.44	-0.00	-0.4
OTC	37.00	19.88	Symantec Inc	22.75	0.25	1.1
OTC	24.50	9.60	Symantec Corp	21.50	-0.13	-0.1
OTC	19.75	13.00	SyncOpsys	16.50	-0.50	0.2
OTC	30.00	19.63	System Software Assoc.	25.25	-0.06	0.2
OTC	7.75	3.75	Tenfold Corp	5.50	-0.25	-4.3
OTC	24.00	7.00	Visual Logic System	10.75	-0.13	1.2
OTC	22.00	10.75	VMark Software Inc	16.00	0.13	0.8
OTC	10.75	5.50	Walsh Interactive Systems	5.63	0.50	4.3
OTC	55.50	36.49	Wall Data Inc.	38.00	-0.25	1.4
OTC	18.25	9.13	Wang Laboratories Inc	13.13	0.00	0.0
Semiconductors						UP 1.04%
NYS	37.63	22.25	Advanced Micro Devices	34.38	0.50	1.5
NYS	51.00	16.00	Analog Devices Inc	42.75	0.88	2.2
OTC	80.25	21.63	Atmel Corp	47.75	1.00	2.7
OTC	11.13	3.63	Chips and Technologies	10.50	0.25	2.5
OTC	33.50	21.00	Cirrus Logic	54.00	2.00	3.8
NYS	31.25	15.00	Cypress Semiconductor Corp	35.00	2.13	6.5
NYS	20.25	13.50	Dallas Semiconductor	18.50	0.63	3.3
OTC	31.75	14.75	Integrated Sensor Systems	50.00	1.00	2.0
OTC	110.81	56.13	Intel Corp	127.13	0.63	0.5
NYS	27.25	22.50	Intersil Corp	25.88	0.75	3.0
OTC	35.50	15.50	Lattice Semiconductor	32.63	-0.38	1.1
NYS	50.75	15.25	Micron Technology	47.88	1.50	3.2
NYS	44.75	43.50	Motorola Inc	62.88	2.25	3.7
NYS	28.50	14.38	National Semiconductor	26.75	0.00	0.0
OTC	12.00	8.75	Sierra Semiconductor	39.38	0.75	2.5
NYS	136.11	83.50	Texas Instruments	120.38	1.38	1.1
OTC	50.13	30.25	VLSI Technology	38.75	0.88	2.3
OTC	5.75	1.78	Weitek	4.75	0.25	5.6
ASE	19.63	11.63	Western Digital Corp	18.00	0.75	4.1
OTC	87.00	39.00	Zilog	48.00	0.63	0.7
OTC	37.74	37.25	Zoran Inc	37.25	0.00	0.0
Peripherals and Subsystems						UP 0.37%
OTC	21.50	14.50	American Power Conversion	18.13	0.38	2.0
OTC	37.00	15.00	Adaptec Inc	31.50	0.25	0.8
OTC	27.75	18.75	Basic Inc.	19.25	0.13	0.8
OTC	8.00	3.38	Cambex Corp (H)	6.50	0.13	2.0
ASE	4.75	1.88	Comtrol Corp	3.94	0.00	3.4
NYS	15.00	9.00	Conner Peripherals	13.75	0.50	3.8
OTC	24.00	7.50	Creative Technologies Inc	8.18	0.06	0.7
OTC	11.75	3.50	Data Race Inc.	11.63	0.50	4.5
ASE	7.63	4.13	Datatape Corp	5.31	0.00	3.2
NYS	24.00	12.50	EMC Corp	23.44	0.56	2.3
OTC	22.63	6.75	Emtek Corp	21.00	0.00	3.4
OTC	18.50	11.75	Evans & Sutherland	13.75	-0.75	5.2
OTC	24.00	11.75	Exabyte	13.13	-0.50	3.7
OTC	8.63	1.88	Intelligent Info. Systems	5.00	-0.01	1.2
OTC	15.75	1.50	Iomega Corp	15.00	-0.01	1.0
OTC	6.75	2.00	IPL Systems Inc	4.75	-0.13	2.6
OTC	42.63	37.00	Komag Inc.	41.75	1.00	0.7
OTC	6.50	2.63	Maxtor Corp	5.75	0.25	4.5
OTC	11.50	4.00	Micropolis Corp	5.00	-0.13	2.1
OTC	16.75	8.75	Pomalex Micro Inc.	11.00	0.25	2.1
OTC	28.75	5.01	Printronix Inc.	22.75	0.00	0.0
NYS	10.75	5.13	QMS Inc	5.63	0.00	0.0
OTC	22.21	13.63	Quantum Corp	21.75	1.13	5.5
OTC	19.00	7.50	Radius Inc	11.00	1.25	12.0
NYS	0.63	0.50	Resource Information	0.63	0.00	0.0
OTC	7.00	3.63	Reson Inc. (L)	3.61	-0.50	12.1
OTC	38.88	18.63	Seagate Technology	57.38	5.75	3.5
NYS	39.11	17.00	Storage Technology	31.13	-0.25	1.6
NYS	67.50	27.50	Tandberg Inc	44.63	-0.38	0.8
NYS	175.88	90.63	Xebec Corp	114.75	6.75	6.7
Services						UP 0.78%
OTC	24.38	14.31	American Mgmt. Systems	22.13	0.75	3.1
OTC	8.88	0.96	Analtyp Inc	1.13	0.38	50.0
OTC	27.50	14.50	Analysts Int'l	25.00	-1.00	4.0
NYS	66.88	50.75	Auto Data Processing	62.75	1.75	2.9
OTC	16.25	14.00	Cambridge Tech. Partners	12.31	-0.13	0.4
NYS	35.38	31.50	Computer Corp	32.88	0.50	1.5
OTC	18.88	14.13	Compuserve Inc	29.00	-0.38	-1.2
OTC	14.00	5.50	Computer Horizons	12.50	0.25	2.0
OTC	50.50	39.25	Computer Sciences (H) **	53.50	0.88	1.7
NYS	12.50	7.50	Computer Task Group	11.25	-0.63	5.3
NYS	39.63	6.75	CompUSA Inc.	26.13	1.75	8.7
OTC	11.38	5.50	Cortron Data Systems Inc.	10.50	0.50	5.1
OTC	12.13	6.13	Edmark Discovery Software	10.00	0.00	0.0
NYS	44.13	33.00	General Motors E (EDS)	44.13	1.50	3.2
OTC	34.25	6.88	Macron Corp	10.00	-0.63	5.9
OTC	21.38	7.50	Intelligent Electronics	12.25	0.50	3.6
OTC	17.50	3.00	Meridel	6.11	-0.50	3.8
OTC	25.75	8.50	Microdata Inc	11.00	0.00	0.0
OTC	32.50	19.00	Pinnacle	31.00	-0.25	0.8
NYS	51.67	30.63	Policy Management Sys.	47.00	-0.13	-0.3
NYS	30.88	22.25	Reynolds and Reynolds	28.38	1.00	4.5
OTC	22.25	16.75	SEI Corp	19.75	0.50	2.9
OTC	38.13	22.75	Shared Medical Systems	37.63	1.19	3.1
OTC	8.00	4.00	SHL Systemhouse	6.31	-0.19	2.9
OTC	21.50	9.25	Software Spectrum Inc	17.25	0.13	0.7
OTC	50.63	32.25	Sungard Data Systems (H)	46.88	0.50	0.8

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

Copyright Norrisy International Inc., Boulder, Colorado
This information is based on sources believed to be reliable, and while extensive efforts are made to assure its accuracy, no guarantee can be made. Norrisy International and Computerworld assume no liability for any inaccuracies. For information on Norrisy's customized financial research services, call (800) 926-7404

Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0781697. Computerworld (USPS 200-404) is published weekly except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Copyright 1995 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Requests for other uses, including multiple copying for resale, should be addressed to the CCC. Reprints may be purchased from Sharon Bryant, Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $6.00 a copy; U.S. – $48 a year; Canada – $100 a year; Central & So. America – $150 (surface) a year; Europe – $295 a year; all other countries – $295 a year. Subscriptions call toll free (800) 669-1002. POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

ORACLE CLAIMS WE MAKE MAINFRAME ACCESS DIFFICULT.



Oracle's been making a lot of claims lately about our mainframe access. Here's the truth. Sybase® is the number one choice in mainframe connectivity.* You can install one of several Sybase gateways and interoperability products. No programming required. You can install any of over 125 certified front-end tools. No programming required. Then you can point and click to build a SQL query with the tool of your choice. No programming required. Sybase products will get your query to the mainframe. Execute it. And get the answer back to you. No programming required. Starting to get the picture? For a free truth-filled white paper or a visit to our lab, call us at 1-800-221-3634 ext. 7610. Or better yet, ask any of the 1000 customers who use Sybase products to gain access to their mainframes. No programming required. No matter how long Oracle's nose may grow.

SYBASE®
The Architecture for Change™

Outside the U.S. call 410-224-8044 *Meta Group 1994 © 1995 Sybase, Inc.

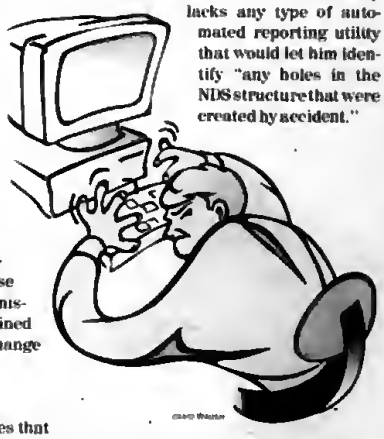
Stealth users

CONTINUED FROM COVER 1

4.x, a stealth user who breaches security on one file server can run rampant through the entire network.

"It's clearly a problem — and an unnerving one for network administrators — because there's no easy way to track the stealth user," said Charles Rose, principal at Roseware, a software development and consulting firm in Asheville, N.C.

Willy Donahoo, Novell's director of product marketing for NetWare, last week acknowledged that stealth users pose a problem for network administrators who are not careful about assigning supervisory rights. That is because NetWare 4.x does not allow administrators to grant narrowly defined rights, such as just the ability to change passwords, Donahoo said.



Additional capabilities

"We will provide users with utilities that give them enhanced reporting capabilities so they can more easily ferret out stealth users," Donahoo said. Novell also plans to deliver more levels of administration, which will allow managers to give users varying levels of administrative functionality without compromising network security.

But Novell has no set delivery date for these utilities. So, for the time being, network administrators are on their own. However, there is at least one NetWare security product available today for users (see related story below).

The specter of stealth users insidiously working their way through all the branches in NDS is raising alarm among users on Novell's NetWire forums on CompuServe.

One user characterized the situation as "mind-boggling," while another lamented the fact that Novell currently lacks any type of automated reporting utility that would let him identify "any holes in the NDS structure that were created by accident."

"I realize that in some cases you would want to hide various parts of the NDS [tree], but I still should be able to identify these hidden intersections," said the administrator who requested anonymity.

Users and security experts agreed that NetWare 4.x — with its advanced NDS component — is inherently secure. But they cautioned that granting administrative rights to anyone but the most trusted individuals can be asking for trouble.

The directory services component stores network items such as user names, locations, security access rights and other descriptive information in a distributed database.

When a network administrator grants supervisory or administrative privileges to others, those people have the ability to modify their own trustee-assigned privileges, access rights and objects, said Robert Kane, president of Intrusion Detection, Inc. in New York, which specializes in security software detection packages. "Using the trustee assignments, a malicious individual could then cut off basic Browse and object scanning capabilities and become suddenly invisible," he explained.

Organizationwide results

Mike Jepsen, network manager at Medtronics, Inc. in Fridley, Minn., the world's largest pacemaker manufacturer, estimated that fewer than 1% of the 6,000 NetWare users in his organization — or about 20 people — would have the know-how to get around administrative security.

"But it only takes one stealth user to cause trouble, which can reverberate through an entire organization," Jepsen said.

Tracking the stealth user and unmasking his identity is a tedious, manual process in which the network administrator must search every network nook and cranny to locate anything that appears to be hidden or has unusual rights that run on a regular basis.

The other method for catching a stealth user is to design a custom utility written using Novell's AppWare, a daunting and time-consuming task for everyone but AppWare developers.

Security concerns

In the absence of a reporting utility from Novell that is capable of detecting stealth users, common sense and good security practices are still a network administrator's best defenses.

Mike Jepsen, network manager at Medtronics, Inc., and Robert Kane, president of Intrusion Detection, strongly advise that administrators grant property rights, *not* object rights, to users.

Of the two options in property rights, *never* grant users "all properties," Jepsen said. That option gives users the ability to do whatever they want and change the properties of the object. "With access to the 'Add-Self' option, for instance, users could make themselves NetWare administrators," Jepsen said.

Instead, administrators should choose selected properties, which grants users specific property rights and denies access to everything but the selected property.

Jepsen and Kane also recommend the following:

- Only assign supervisory rights to qualified, trusted administrators.
- Use the built-in auditing in NetWare 4.x to monitor all users' activities.
- Get the proper training and read the manual.

—Laura DiDio

StrataCom moves in on ATM market

CONTINUED FROM COVER 1

work, according to Hindin.

John Boyd, chief networking technologist at Northeast Utilities in Berlin, Conn., already uses both the StrataCom IPX and BPX switches and applauds StrataCom's move into the ATM market.

"We like the fact they're moving into ATM; StrataCom was doing cell relay in the T-1 marketing when everyone said it was impossible," Boyd said. "It was great practice for their ATM efforts since it proved StrataCom could successfully implement delay management at low speeds. So doing it at OC/3 ATM and T-3 speeds should be a natural progression."

The new IGX melds the best features of both the earlier Integrated Packet Exchange (IPX) 32M bit/sec. entry-level cell switch and the Broadband Packet Exchange (BPX) 9.6G-bit cell-matrix backbone switch. The IGX is available in either a 16- or 32-slot configuration. It incorporates advanced features such as silence suppression, 4-to-1 voice compression, 2-to-1 data compression and Auto-Route and Fore-Sight congestion management capabilities.

The Fore-Sight facility, for instance, buffers information to ensure that no data is lost during peak usage periods, the sources said.

Ethernet, Token Ring and Fiber Distributed Data Interface LAN connections are supported via the NetEdge Systems, Inc. Edge Connect ATM router, which StrataCom resells.

The StrataCom IGX switch is available now. Prices ranges from $26,000 to $300,000, depending on configuration.

Sizzling switch

StrataCom's Integrated Gigabit Exchange switch includes the following:

- 1.2G bytes of aggregate bandwidth
- Support for voice, data and video
- Congestion management capabilities buffer information so no data is lost
- Compatibility with existing StrataCom IPX and BPX switches
- Support for evolving ATM Forum class of service designations including available bit rate, continuous bit rate, unspecified bit rate and the two classes of variable bit rate
- List prices range from $26,000 to $300,000
- Available now

Utility detects stealth users

By Laura DiDio

A recently released upgrade to Intrusion Detection, Inc.'s software utility reportedly can detect stealth users and identify potential gaps in businesses' security by automatically scanning a Novell, Inc. NetWare 4.x network and its directory services tree.

Currently, it is the only such program that can scan and detect for stealth users, said Robert Kane, Intrusion Detection's president.

Kane Security Analyst (KSA) 2.0 is a Windows-based software utility that performs a security review of NetWare 3.x and 4.x LANs. It reviews six categories of security, including password strength, access control, account restrictions, system monitoring, data integrity and data confidentiality.

KSA 2.0 also does not require a NetWare Loadable Module (NLM). This is a big advantage because NLMs can consume anywhere from 10K bytes to multiple megabytes of memory, Kane said.

"KSA is totally passive. It doesn't impact the file server or consume memory," Kane said.

Just not the same

While Novell has fine-tuned security under NetWare 4.x, it differs considerably from prior versions. In NetWare 4.x, it is easy "to accidentally" grant users access to files, directories and the enterprise network, Kane said.

"Since any object or user can be granted privileges to access any other object such as a database, file server or print server on a NetWare 4.x network, it's especially important that corporations ensure that end users are granted only the appropriate access rights," Kane said.

The KSA 2.0 utility costs $495 per server license.

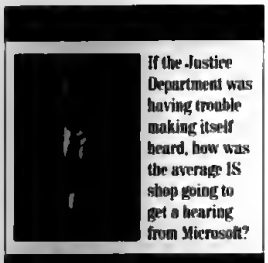
Xyplex adds security to its hubs. See page 56.

Microsoft avoids a fight, IS wins

The specter of a battle with the Justice Department over the Intuit acquisition was a sobering one and one from which Microsoft wisely backed away.

The Redmondians have done their work well with Windows NT and BackOffice and can now capitalize on it among corporate IS. But one of the first things Microsoft must do is convince IS that it can listen as well as lead and that it can respond to others' needs as well as exploit its position of strength.

The prospect of giving IS the attention it deserves looked rather dim when Microsoft was headed for a knockdown dispute over acquiring a monopoly in personal finance applications. Bill Gates' vow to fight made it look as though Microsoft's first commitment was to dominating a future consumer market, not serving its existing commercial ones.



If the Justice Department was having trouble making itself heard, how was the average IS shop going to get a hearing from Microsoft?

Charles Babcock

An IS manager had to wonder: If the Justice Department was having trouble making itself heard, how was the average IS shop going to get a hearing from Microsoft?

So the company has returned to earth. At least temporarily. Its real opportunity lies not so much in getting into home banking or TV set-top boxes as in getting onto corporate NT servers. Its success rate there is still low, but it looks as if that could change in the coming year. The well-funded Hermes project is now blossoming as Systems Management Server (SMS) in the BackOffice suite. SMS, SNA Server, Mail Server and SQL Server constitute the potentially integrated set of BackOffice.

"Suite" is still an optimist's word in describing this group of server products. I have no evidence that the information gathered by one server is used intelligently by another, but the need for a BackOffice suite is overwhelming. Microsoft is working hard to get the products to live up to their names.

Managing PCs, taking inventory of resources, upgrading operating systems and adding and deleting applications make up two-thirds of the burgeoning cost of PC maintenance. Microsoft says it will bring these costs to heel.

Microsoft isn't the only vendor that can do this. Novell's NetWare 4.1 is finally shaping up as an enterprise PC manager. Independent suppliers such as Novadigm in Mahwah, N.J., are doing sophisticated, multiple LAN management from a remote server. But no one else who aspires to the task is in Microsoft's position of having revenue of $321,500 per employee.

With its resources, Microsoft can take SMS and slim down what is currently a resource hog. SMS agents on desktops report to the server with each log-on, thus offering an inventory of a PC's hardware and software. Remote technicians can troubleshoot individual end-user problems and download application or operating system upgrades.

SNA Server already connects to and manages other hosts. SQL Server offers data integrity and transaction processing features. Other parties do some of these tasks better than Microsoft, but they will have a hard time assembling all the pieces in an integrated package.

The BackOffice suite represents the playing out of the systems thinking that went into Windows NT. Other Microsoft technologies have fallen short in terms of IS's needs (OLE springs to mind), but BackOffice supplies systems management just in time. Customer demand for it will lay the groundwork for a lot of NT's success.

For Microsoft to take its eye off this rich prize to prove that the U.S. government had no business second-guessing its business decisions would have been an expression of corporate hubris. Backing off the Intuit fight shows that Microsoft's judgment is maturing and perhaps that its ability to address corporate IS is improving. It's unfathomable why Microsoft, having gotten this far, wouldn't give NT and BackOffice their best chances.

Babcock is *Computerworld*'s technical editor. His Internet address is cbabcock@cw.com

How to contact *Computerworld* editors:

	Phone:	Fax:
Main office, Framingham, Mass.	(508) 879-0700	(508) 875-8931
24-hour tip line	(508) 820-8555	
Mid-Atlantic bureau, Rochelle Park, N.J.	(201) 587-0090	(201) 712-1808
Washington bureau, Washington	(202) 347-0134	(202) 347-2365
Midwest bureau, Des Plaines, Ill.	(708) 827-4433	(708) 827-9159
West Coast bureau, Burlingame, Calif.	(415) 347-0555	(415) 347-6831
Northwest bureau, Bellevue, Wash.	(206) 641-7770	(206) 747-1021

☞ **Electronic mail:** *Computerworld*'s writers and editors have individual **MCI Mail** accounts. Most of our staff members can be reached on MCI Mail by addressing messages to their first and last names as they appear on the masthead, which is opposite the editorial page. For a complete list of editorial MCI Mail addresses, message Linda Gorgone at 597-8014.

☞ Our **CompuServe** account number is 76537,2413. Please use that account only for communications with writers and editors. *Computerworld* cannot guarantee response to all inquiries. Direct subscription inquiries to CompuServe: 73373,1330.

☞ **Letters to the editor** and other editorial-related messages can be sent via **Internet** to letters@cw.com

☞ **Client/Server Journal:** Contact Editor Alan Alper at (508) 820-8115 or via Internet at aalper@cw.com

☞ **Subscriptions:** Inquiries and changes of address should be sent to P.O. Box 2043, Marion, Ohio 43305-2403 or call (800) 669-1002.

☞ **Reprints:** Contact Sharon Bryant at (508) 820-8125.

☞ **Rapid Reference clipping service:** (800) 343-6474 x554.

Inside Lines

No group hugs for this bunch

One sight that PowerBuilder users won't see at their annual conference next week is a group hug among execs from Oracle and PowerBuilder's owner Sybase. More than a month after a self-imposed, end-of-April deadline, the database rivals have yet to sign a deal to play nice together. The companies were supposed to hammer out a deal to exchange certain APIs and other code related to their respective databases, enabling their development tools to support each other's databases. It hasn't happened yet, so users of the popular PowerBuilder 4.0 cannot easily access data stored on the latest Oracle database and vice versa.

Novell's Requester on the horizon

The wait will soon be over for Novell's NetWare Client for Windows NT requester. Novell is expected to make the requester available sometime in the next 10 days, says Willy Donahoo, Novell's director of product marketing for NetWare. Users will be able to download the requester software, free of charge, by logging in to the NetWire forum on CompuServe. The NetWare Client requester provides Microsoft's Windows NT users with full access to all seven core services contained in NetWare 4.x, including security and directory services.

After you. No, after you. No, no! After you . . .

Keeping a close watch on each other, bitter mainframe disk rivals IBM and EMC will make back-to-back product announcements next Tuesday and Wednesday, although EMC's is targeted at the Unix market instead of System/390 users. IBM is releasing an upgrade of its Ramac mainframe array based on 4G-byte disk drives — twice the size of the current Ramac drives. EMC will follow the next day by introducing Unix versions of its Symmetrix arrays.

Musical jobs in networking

The long-past merger of the former SynOptics and Wellfleet into Bay Networks is creating some interesting job opportunities these days. Word around Silicon Valley is that many former SynOptics employees are jumping ship — many of them to chief Bay rival Cisco. Cisco just hired Bay's worldwide channels manager Steve Behm, charging him with building up the channel and relationships with carrier vendors such as Bell Atlantic and US West.

FileNet and Novell to team up

Workflow leader FileNet plans to make an announcement about its new relationship with Novell at this month's PC Expo in New York. Word leaked recently that the agreement involved adding FileNet's workflow and imaging software to the next version of Novell's GroupWise groupware product, although sources at both companies declined to comment.

Big iron on the P6 bandwagon

Unisys wants to be one of the first companies on Intel's P6 bandwagon when the next-generation chip ships late this year. Unisys' Pentium-based parallel processing Opus server can be upgraded to P6 in about two weeks, Ron Bell, Unisys' chief technology officer, said last week, although he wouldn't commit to actually shipping a P6 server that quickly. Bell also said the next major revamp of Opus, which ships this month, will put dozens of processors on a high-speed data bus, compared with four today.

Oh sure, there's important stuff like on-line commerce and the scientific data exchange going on over the Internet. But Oracle wants to make sure life's lighter side doesn't pass us by. So the company's Iceland office, along with two small Internet firms there, built a Web server dedicated to tracking The 14th Annual World Handball Championships in Reykjavik. The server, at http://www.handball.is, shows player bios, game plans and other exciting information — in both English and Icelandic. What next? Reports from the local Elks Lodge bowling league? Save us from having to watch by getting in touch with Computerworld *about news items or tips. Call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at mjohnson@cw.com.*

Smart Networks for Smart People.™

Make Your Remote Sites Enterprising.

ONsemble StackSystem.™
A complete system of Token Ring and Ethernet solutions
for remote sites and campus networks.
Fault tolerant. Remote controllable. Auto configurable.
Call 1-800-228-9930.

CHIPCOM™

© 1995 Chipcom Corporation, Southborough Office Park, 118 Turnpike Rd., Southborough, MA 01772 Chipcom U.S. Tel (508) 460-8900 Chipcom Europe Tel 44(0) 494 764476 Chipcom Asean Tel 60-3-233-6212
The Chipcom logo, ONsemble and StackSystem and Smart Networks for Smart People are trademarks and Chipcom is a registered trademark of Chipcom Corporation GS00K94AGS5125 GS00E94AGS5155

THE ONE MEMORY SHARED BY MILLIONS.

What's your favorite memory? If you answered Kingston, you're in very good company. You see, we've become the most popular memory in the world by maintaining an uncompromised dedication to reliability. That means bench testing each and every [redacted] product in the system for which it was designed with diagnostics written by the system's original manufacturer. When it comes to compatibility, we leave absolutely nothing to chance. We suspect that's why—in a recent Gallup poll—Kingston was reported as the largest independent memory supplier to the Fortune 1000 Companies. They rely on our upgrades every single day—and you can too. For more information, call your local dealer or Kingston at (800) 251-9059. Find out why, when it comes to memory, we're on the minds of millions.

Fully Tested Compatibility

[redacted]

Desktop PC Memory

Portable PC Memory

[redacted]

Workstation Memory

[redacted]

Laser Printer Memory

Kingston TECHNOLOGY CORPORATION

THE INSIDE NAME IN UPGRADES

(714) 435 2600 or Fax (714) 435 2699. In Canada, Dynatech Ltd (416) 636 4000 or in Mexico Intec (8) 335 6161. Ingram Dicom (5) 328 1100